R F – T E S T R E P O R T

- FCC Part 15.255, RSS210 -

Type / Model Name	:	MB1
Product Description	:	Mediaboard with 60 GHz short range radar
Applicant	:	Schindler
Address	:	Via della Pace 22
		6600 LOCARNO, SWITZERLAND
Manufacturer	:	Schindler
Address	:	Via della Pace 22
		6600 LOCARNO, SWITZERLAND

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. : 80192188-02 Rev_1	02. October 2024 Date of issue

Deutsche Akkreditierungsstelle D-PL-12030-01-00

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ATTACHMENTs A, B as separate supplements

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations (October 2024)

Part 15, Subpart A	General
Part 15, Subpart C, Section 15.255	Operation within the band 57-71 GHz.
ANSI C63.10: 2013	Testing Unlicensed Wireless Devices

ISED Canada Rules and Regulations

RSS-Gen, Issue 5 + Amendment 1 + 2	General Requirements for Compliance of Radio Apparatus
RSS-210, Issue 11	Licence-Exempt Radio Apparatus: Category I Equipment
ANSI C63.10: 2013	Testing Unlicensed Wireless Devices

2 EQUIPMENT UNDER TEST

2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

2.2 Sampling

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according his/her instructions.

2.3 Photo documentation of the EUT – see Attachment A

2.4 Equipment category

The EUT qualifies under FCC §15.255(c)(2)(v) as a field disturbance sensor, and
under RSS-210 J.3.2.a as a field disturbance sensor.

2.5 Short description of the equipment under test (EUT)

The EUT is a mediaboard equipped with a field disturbance sensor in the operating band of 61.0 GHz to 61.5 GHz (BGT60LTR11AIP) and is used in elevator panels for the destination control of elevators.

Number of tested samples:	6
Serial number:	#1 (CH1 CW), #2 (CH3 CW), #3 (CH4 CW) #4 (CH1 pulsed), #5 (CH3 pulsed), #6 (CH4 pulsed)
Firmware version:	V1.0.05
HVIN:	PMB
PMN:	PMB
FCC ID:	XFIPMB
IC ID:	9114A-PMB

2.6 Variants of the EUT

There are 2 different variants of the MB1:
1. Fully assembled - PMN: PMB
2. Only the radar part is assembled - PMN: PMBL
Note: In this test reports only variant 1 (PMB) is covered.

2.7 Operation frequency and channel plan

The operating frequency is 61.0 GHz to 61.5 GHz.

Channel	Frequency (GHz)
1	61.1
2	61.2
3	61.3
4	61.4

2.8 Transmit operating modes

TX modulated
TX CW (test mode, not used in normal operation)

2.9 Antenna

The following integrated antennas are used with the EUT:

Number	Characteristic	Model number	Plug	Frequency range (GHz)	Gain (dBi)
1	linear	On chip patch antenna for TX	-	61.0-61.5	6
2	linear	On chip patch antenna for RX	-	61.0-61.5	6

The antennas cannot be unattached by the user.

2.10 Power supply system utilised

Power supply voltage V_{nom} : 3.3 V/DC

2.11 Peripheral devices and interface cables

The following peripheral devices and interface cables are connected during the measurements:

- Power supply cable Model : custom-built

2.12 Determination of worst case conditions for final measurement

Exploratory measurements have been made in all three orthogonal axes and the settings of the EUT are changed to locate at which position and at what setting of the EUT produce the maximum of the emissions.

As worst case, the following channels and test modes are selected for the final test:

Available channels	Tested channels	Power setting	Modulation	Modulation type
1 - 4	1, 3, 4	P_{max}	digital	OOK

2.12.1 Test jig

No test jig used.

2.12.2 Test software

The test software allows to select a channel in TX CW or TX pulsed mode.

3 TEST RESULT SUMMARY

Operating in the 61 GHz – 61.5 GHz band:

FCC Rule Part	RSS Rule Part	Description	Result
15.207(a)	RSS-Gen 8.8	AC power line conducted emissions	passed
15.255(c)(2)(v)	RSS-210 J.3.2.a	EIRP	passed
15.255(d) 15.209(a)	RSS-210 J.4 RSS-Gen 8.9	Spurious emissions	passed
15.255(e)	RSS-210 J.3.3.d	Peak conducted output power	not applicable[1]
15.255(c)(2)(v) 15.255(e)(1)	RSS-Gen, 6.7	Emission bandwidth, 99% bandwidth	passed
15.255(f)	RSS-210 J.6	Frequency stability	passed
15.203	-	Antenna requirement	passed
15.35(c)	RSS-Gen 8.2	Pulsed operation	passed

Note 1: Not applicable, no peak conducted output power limit defined for FDS which operate in compliance with FCC 15.255(c)(2)(v) or RSS-210 J.3.2.

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80192188-02	0	07 February 2024	Initial test report
80192188-02	1	02 October 2024	1: RSS-210 updated to Issue 11; 2.4: updated to RSS-210 J.3.2.a; 2.9: antenna gain corrected; 4.5.3.2.4 + 4.5.3.2.5: EUT height and distance corrected; 5.4: after update of RSS-210 to Issue 11 now N/A; 5.8: details to pulsed operation added; 6: DC equipment added

The test report with the highest revision number replaces the previous test reports.

3.2 Final assessment

The equipment under test fulfils the requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 09 January 2024

Testing concluded on : 18 January 2024

Checked by:

Thomas Weise
Digitally signed by Thomas Weise
Date: 2024.10.02 16:55:33 +02'00'

Thomas Weise
Laboratory Manager

Tested by:

Sabine Kugler
2024.10.02 16:19:37 +02'00'

Sabine Kugler
Radio Team

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15 - 35 ° C
Humidity:	30 - 60 %
Atmospheric pressure:	86 - 106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 % The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Measurement Type	Range	Confidence Level	Calculated Uncertainty
AC power line conducted emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
Output power ERP, radiated	40000 MHz to 110000 MHz	95%	± 5.41 dB
Field strength of the fundamental	1000 MHz to 40000 MHz	95%	± 2.34 dB
Field strength of the fundamental	40000 MHz to 110000 MHz	95%	± 5.41 dB
Power spectral density	40000 MHz to 110000 MHz	95%	± 5.41 dB
Spurious Emissions, conducted	9 kHz to 10000 MHz	95%	± 2.15 dB
Spurious Emissions, conducted	10000 MHz to 40000 MHz	95%	± 3.47 dB
Spurious Emissions, radiated	9 kHz to 30 MHz	95%	± 3.53 dB
Spurious Emissions, radiated	30 MHz to 1000 MHz	95%	± 4.44 dB
Spurious Emissions, radiated	1000 MHz to 40000 MHz	95%	± 2.89 dB
Spurious Emissions, radiated	40000 MHz to 60000 MHz	95%	± 5.04 dB
Spurious Emissions, radiated	60000 MHz to 90000 MHz	95%	± 5.04 dB
Spurious Emissions, radiated	75000 MHz to 110000 MHz	95%	± 5.04 dB
Spurious Emissions, radiated	110000 MHz to 170000 MHz	95%	± 5.04 dB
Spurious Emissions, radiated	140000 MHz to 220000 MHz	95%	± 5.04 dB

4.4 Conformity Decision Rule

The conformity decision rule is based on the ILAC G8 published at the time of reporting.

4.5 Measurement protocol for FCC and ISED

4.5.1 General information

CSA Group Bayern GmbH is recognized as wireless testing laboratory under the CAB identifier:

FCC: DE 0011
ISED: DE0009

4.5.2 General Standard information

The test methods used comply with ANSI C63.10 - "Testing Unlicensed Wireless Devices".

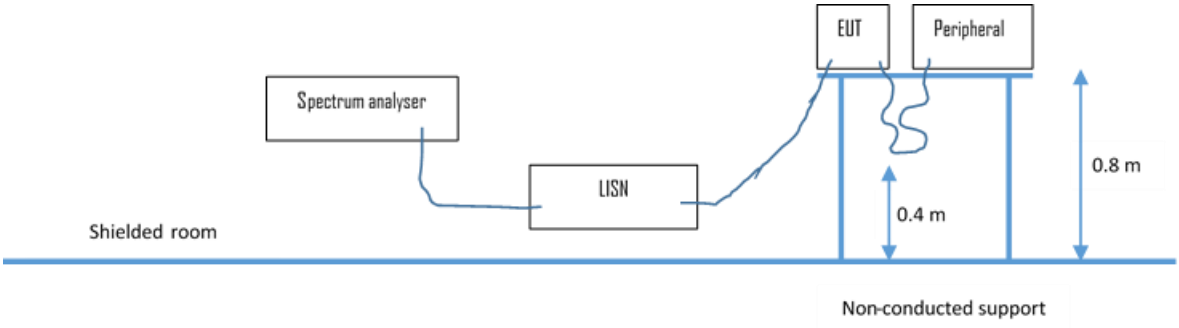
4.5.2.1 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions.

4.5.3 Details of test procedures

4.5.3.1 Conducted emission

Test setup according ANSI C63.10



The final level, expressed in dBμV, is arrived at by taking the reading directly from the Spectrum analyser. This level is compared to the limit.

To convert between dBμV and μV, the following conversions apply:

dBμV = 20(log μV)

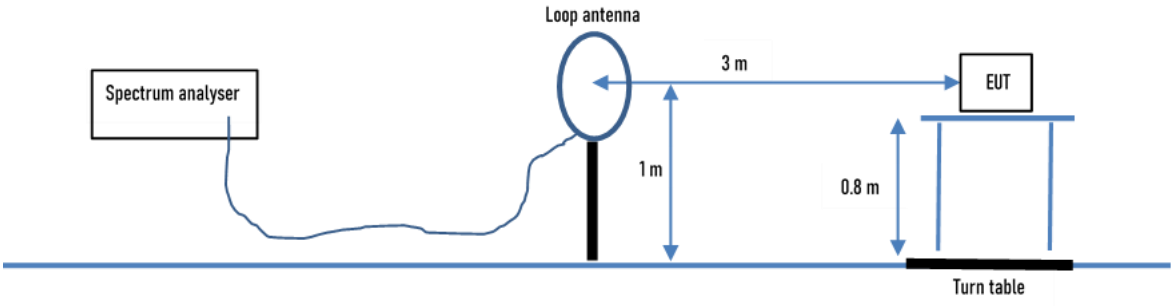
μV = Inverse log(dBμV/20)

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50 Ω / 50 μH (CISPR 16) characteristics. The receiver is protected by means of an impedance matched pulse limiter connected directly to the RF input. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emission is re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

4.5.3.2 Radiated emission

4.5.3.2.1 OATS1 test site (9 kHz - 30 MHz):

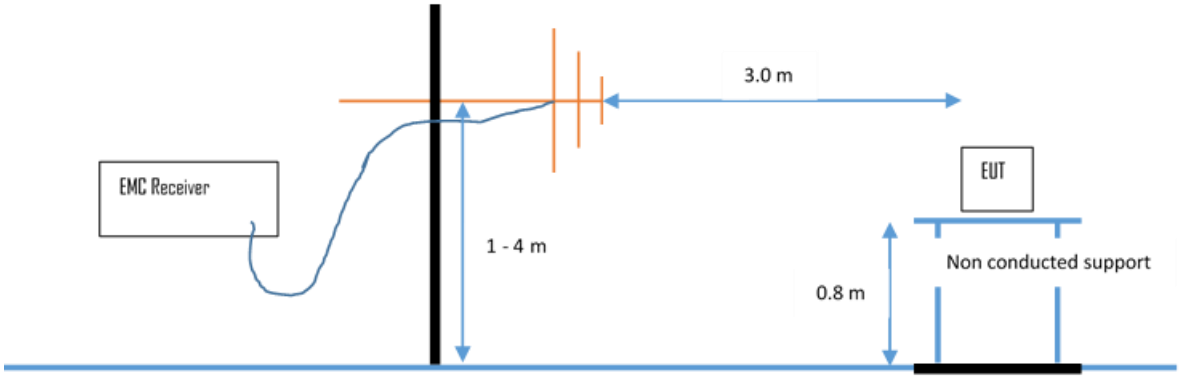
Test setup according ANSI C63.10



Emissions from the EUT are measured in the frequency range of 9 MHz to 30 MHz using a tuned receiver and a calibrated loop antenna. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EUT and is repeated vertically. To locate maximum emissions from the test sample the antenna is varied along the site axis and the EUT is rotated 360 degrees.

4.5.3.2.2 OATS1 test site (30 MHz - 1 GHz):

Test setup according ANSI C63.10.



Spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarised antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screened room located outside the test area. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres and the EUT is rotated 360 degrees. The final level in dBµV/m is calculated by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (dB). The FCC limit is subtracted from this result in order to provide the limit margin listed in the measurement protocol.

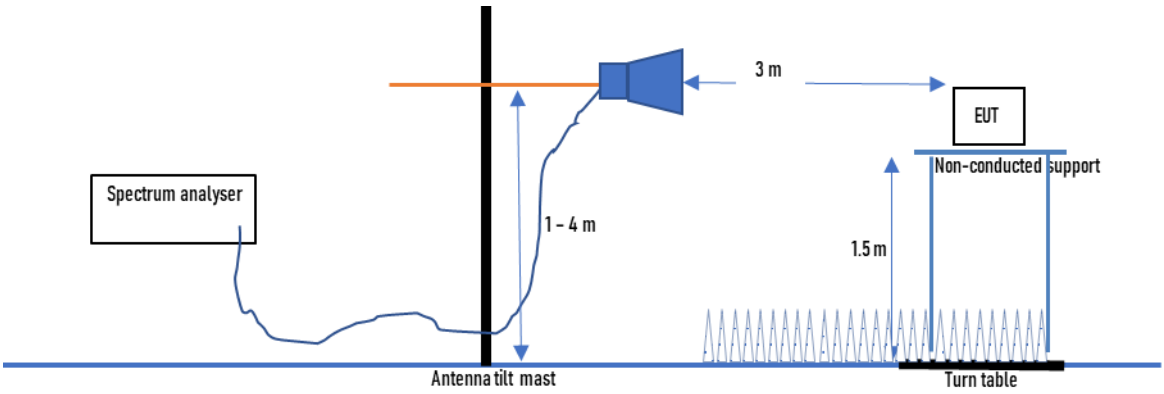
The resolution bandwidth setting:
30 MHz – 1000 MHz: RBW: 120 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	-	Limit (dBµV/m)	=	Delta (dB)
719.0	75.0	+	32.6	=	107.6	-	110.0	=	-2.4

4.5.3.2.3 Anechoic chamber 1 (1000 MHz – 18000 MHz)

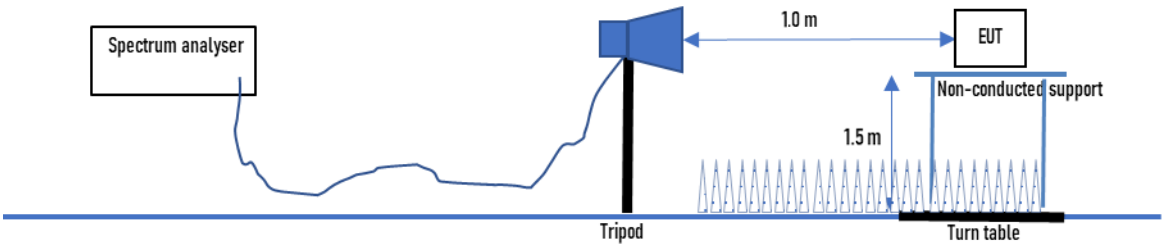
Test setup according ANSI C63.10.



Radiated emissions from the EUT are measured in the frequency range 1 GHz up to 18 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 1.5 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded

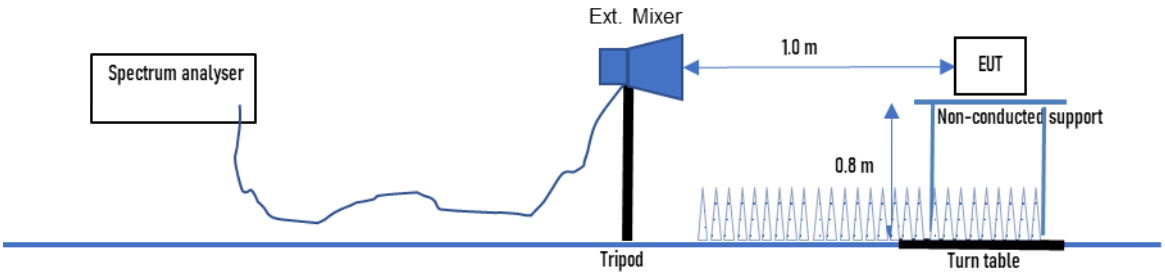
back and forth in the center, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements.

4.5.3.2.4 Anechoic chamber 1 (18 GHz – 40 GHz)



Emissions from the EUT are measured in the frequency range 18 GHz up to 40 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 1.5 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the center, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements. Where appropriate, the test distance may be reduced in order to detect emissions under better uncertainty. The limit are adopted.

4.5.3.2.5 Anechoic chamber 1 (40 GHz – 200 GHz)



Emissions from the EUT are measured in the frequency range 40 GHz up to 200 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and external mixer with standard gain horn. Table top equipment is placed on a non-conducting table, 0.8 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the center, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements. Where appropriate, the test distance may be reduced in order to detect emissions under better uncertainty. The limit are adopted.

5 TEST CONDITIONS AND RESULTS

5.1 AC power line conducted emissions

For test instruments and accessories used see section 6 Part **A 4**.

5.1.1 Description of the test location

Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up

See Attachment B for detailed photo documentation of the test set-up.

5.1.3 Applicable standard

According to FCC Part 15, Section 15.207(a):
Except as shown in paragraphs (b) and (c) of this Section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the given limits.

According to RSS-Gen 8.8:
Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 µH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

5.1.4 Description of Measurement

The measurements are performed following the procedures set out in ANSI C63.10 described under item 4.4.3. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.5 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 8.6 dB at 24.002 MHz

Limit according to FCC Part 15, Section 15.207(a):

Frequency of Emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

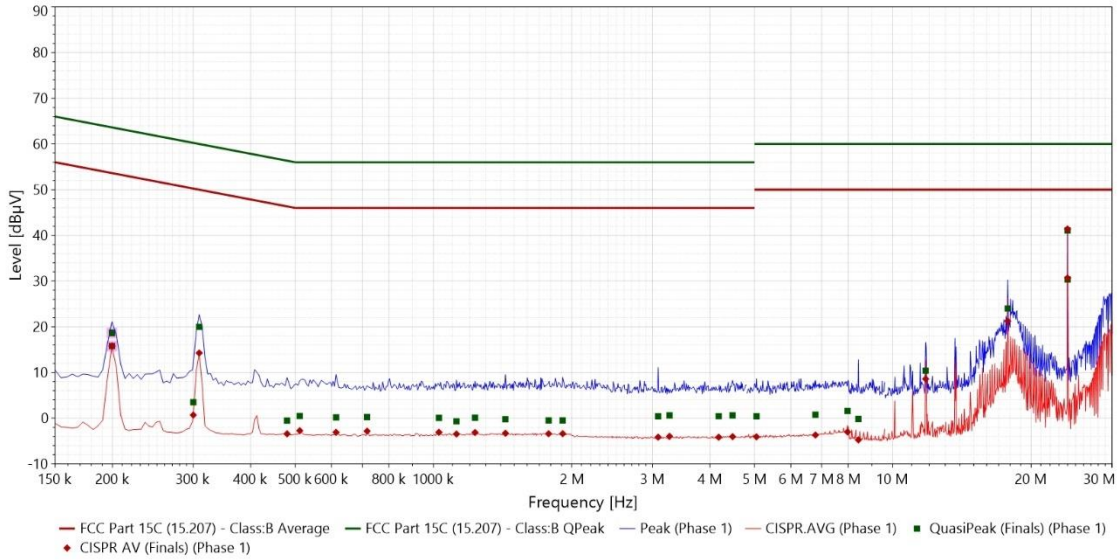
The requirements are **FULFILLED.**

Remarks: For detailed test result please refer to following test protocols.

Tests performed with commercially available laboratory DC power supply HM8143.

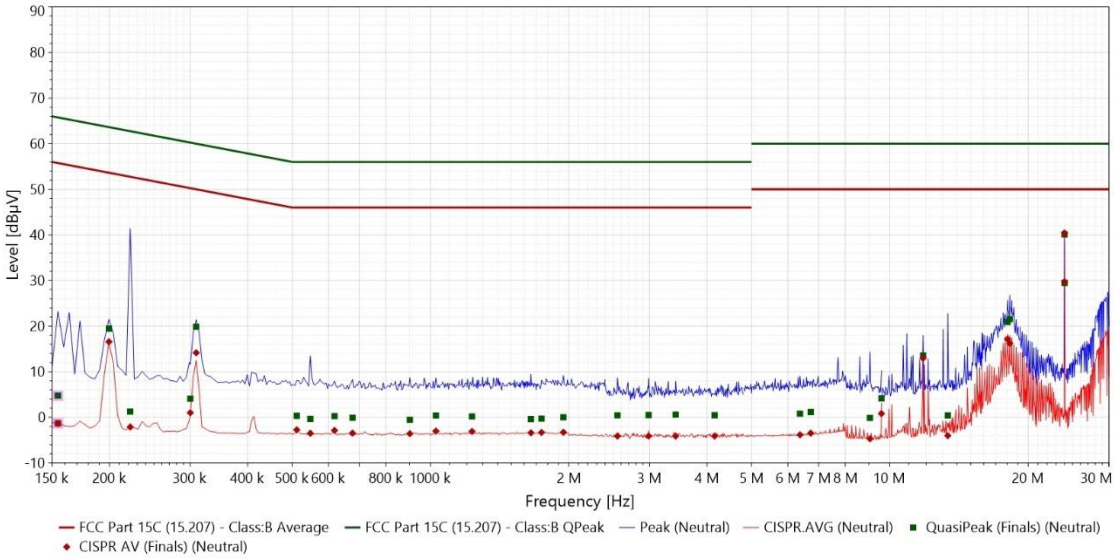
5.1.6 Test protocol

Test point L1 Result: passed
Operation mode: TX



freq	SR	QP	margin	limit	AV	margin	limit	line	corr
MHz		dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.200	1	18.7	-45.0	63.6	15.8	-37.9	53.6	Phase 1	10.1
0.300	1	3.5	-56.8	60.2	0.7	-49.6	50.2	Phase 1	10.1
0.309	2	20.0	-40.0	60.0	14.3	-35.7	50.0	Phase 1	10.1
0.480	2	-0.5	-56.9	56.3	-3.4	-49.8	46.3	Phase 1	10.2
0.512	2	0.5	-55.5	56.0	-2.7	-48.7	46.0	Phase 1	10.2
0.614	3	0.2	-55.8	56.0	-3.1	-49.1	46.0	Phase 1	10.2
0.717	3	0.3	-55.8	56.0	-2.8	-48.8	46.0	Phase 1	10.2
1.028	3	0.1	-55.9	56.0	-3.1	-49.1	46.0	Phase 1	10.2
1.122	3	-0.7	-56.7	56.0	-3.5	-49.5	46.0	Phase 1	10.2
1.232	4	0.1	-55.9	56.0	-3.1	-49.1	46.0	Phase 1	10.2
1.434	4	-0.3	-56.3	56.0	-3.3	-49.3	46.0	Phase 1	10.3
1.781	4	-0.5	-56.5	56.0	-3.4	-49.4	46.0	Phase 1	10.3
1.911	4	-0.5	-56.5	56.0	-3.4	-49.4	46.0	Phase 1	10.3
3.084	5	0.4	-55.6	56.0	-4.2	-50.2	46.0	Phase 1	10.3
3.264	5	0.6	-55.4	56.0	-4.0	-50.0	46.0	Phase 1	10.3
4.178	5	0.4	-55.6	56.0	-4.2	-50.2	46.0	Phase 1	10.4
4.479	5	0.6	-55.4	56.0	-4.0	-50.0	46.0	Phase 1	10.4
5.048	6	0.4	-59.6	60.0	-4.1	-54.1	50.0	Phase 1	10.4
6.785	6	0.8	-59.3	60.0	-3.7	-53.7	50.0	Phase 1	10.6
7.968	6	1.6	-58.4	60.0	-3.0	-53.0	50.0	Phase 1	10.6
8.414	6	-0.2	-60.2	60.0	-4.8	-54.8	50.0	Phase 1	10.6
11.787	7	10.4	-49.6	60.0	8.6	-41.4	50.0	Phase 1	10.8
17.790	7	24.0	-36.0	60.0	21.2	-28.8	50.0	Phase 1	11.2
24.002	8	41.1	-18.9	60.0	41.4	-8.6	50.0	Phase 1	11.5
24.006	8	30.4	-29.6	60.0	30.7	-19.3	50.0	Phase 1	11.5

Test point: N Result: passed
Operation mode: TX



freq	SR	QP	margin	limit	AV	margin	limit	line	corr
MHz		dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.155	9	4.7	-61.0	65.8	-1.3	-57.1	55.8	Neutral	10.1
0.200	9	19.4	-44.2	63.6	16.6	-37.1	53.6	Neutral	10.1
0.222	9	1.2	-61.5	62.7	-2.1	-54.9	52.7	Neutral	10.1
0.300	9	4.1	-56.2	60.2	1.0	-49.2	50.2	Neutral	10.2
0.309	10	19.9	-40.1	60.0	14.2	-35.9	50.0	Neutral	10.2
0.512	10	0.3	-55.7	56.0	-2.8	-48.8	46.0	Neutral	10.2
0.548	10	-0.4	-56.4	56.0	-3.5	-49.5	46.0	Neutral	10.2
0.618	11	0.3	-55.7	56.0	-2.9	-48.9	46.0	Neutral	10.2
0.677	11	-0.1	-56.1	56.0	-3.5	-49.5	46.0	Neutral	10.2
0.902	11	-0.6	-56.6	56.0	-3.6	-49.6	46.0	Neutral	10.2
1.028	11	0.4	-55.6	56.0	-3.0	-49.0	46.0	Neutral	10.2
1.232	12	0.2	-55.8	56.0	-3.1	-49.1	46.0	Neutral	10.3
1.655	12	-0.4	-56.4	56.0	-3.4	-49.4	46.0	Neutral	10.3
1.745	12	-0.3	-56.3	56.0	-3.3	-49.3	46.0	Neutral	10.3
1.947	12	0.0	-56.0	56.0	-3.3	-49.3	46.0	Neutral	10.3
2.553	13	0.4	-55.6	56.0	-4.1	-50.1	46.0	Neutral	10.4
2.985	13	0.5	-55.5	56.0	-4.1	-50.1	46.0	Neutral	10.4
3.417	13	0.6	-55.4	56.0	-4.1	-50.1	46.0	Neutral	10.4
4.155	13	0.5	-55.6	56.0	-4.1	-50.1	46.0	Neutral	10.4
6.375	14	0.8	-59.2	60.0	-3.8	-53.8	50.0	Neutral	10.6
6.726	14	1.2	-58.9	60.0	-3.5	-53.5	50.0	Neutral	10.6
9.053	14	-0.2	-60.2	60.0	-4.7	-54.7	50.0	Neutral	10.6
9.588	14	4.2	-55.8	60.0	0.8	-49.2	50.0	Neutral	10.6
11.814	15	13.6	-46.4	60.0	13.0	-37.0	50.0	Neutral	10.8
13.371	15	0.4	-59.6	60.0	-4.0	-54.0	50.0	Neutral	10.9
18.047	15	20.9	-39.1	60.0	17.2	-32.9	50.0	Neutral	11.0
18.245	15	21.5	-38.5	60.0	16.2	-33.8	50.0	Neutral	11.0
24.002	16	40.1	-19.9	60.0	40.4	-9.6	50.0	Neutral	11.1
24.006	16	29.5	-30.5	60.0	29.8	-20.3	50.0	Neutral	11.1

5.2 EBW and OBW

For test instruments and accessories used see section 6 Part **CPR3**.

5.2.1 Description of the test location

Test location: Anechoic chamber 1
Test distance: 1 m

5.2.2 Photo documentation of the test set-up

See Attachment B for detailed photo documentation of the test set-up.

5.2.3 Applicable standard

According to FCC Part 15, Section 15.255(c)(2)(v):
For field disturbance sensors that occupy 500 MHz or less of bandwidth and that are contained wholly within the frequency band 61.0-61.5 GHz, the average power of any emission, measured during the transmit interval, shall not exceed 40 dBm, and the peak power of any emission shall not exceed 43 dBm.

According to RSS-Gen 6.7:
The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

5.2.4 Description of Measurement

According to FCC Part 15, Section 15.255(e)(1):
For the purposes of this paragraph, emission bandwidth is defined as the instantaneous frequency range occupied by a steady state radiated signal with modulation, outside which the radiated power spectral density never exceeds 6 dB below the maximum radiated power spectral density in the band, as measured with a 100 kHz resolution bandwidth spectrum analyzer. The center frequency must be stationary during the measurement interval, even if not stationary during normal operation (e.g., for frequency hopping devices).

The bandwidth was measured at an amplitude level reduced from the reference level of a modulated channel by a ratio of -6 dB. The reference level is the level of the highest signal amplitude observed at the transmitter at either the fundamental frequency or the first order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

According to RSS-Gen 6.7:
The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:
-The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
-The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
-The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
-The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Spectrum analyser settings for EBW:
RBW: 100 kHz, VBW: 3 x RBW, Detector: Max peak, Sweep time: auto, Span: > 2 EBW;

Spectrum analyser settings for OBW:
RBW: 5 MHz, VBW: 3 x RBW, Detector: Max peak, Sweep time: auto, Span: > 2 OBW;

5.2.5 Test result

6dB bandwidth				
Channel	Centre frequency	f_{low}	f_{high}	Measured EBW
	(GHz)	(GHz)	(GHz)	(MHz)
CH1	61.1	61.096502	61.097952	1.450
CH3	61.3	61.297883	61.299101	1.218
CH4	61.4	61.396062	61.397567	1.505

99% bandwidth				
Channel	Centre frequency	T_1	T_2	Measured OBW
	(GHz)	(GHz)	(GHz)	(MHz)
CH1	61.1	61.087750	61.103758	16.008
CH3	61.3	61.291267	61.304279	13.013
CH4	61.4	61.391933	61.405093	13.160

The requirements are **FULFILLED.**

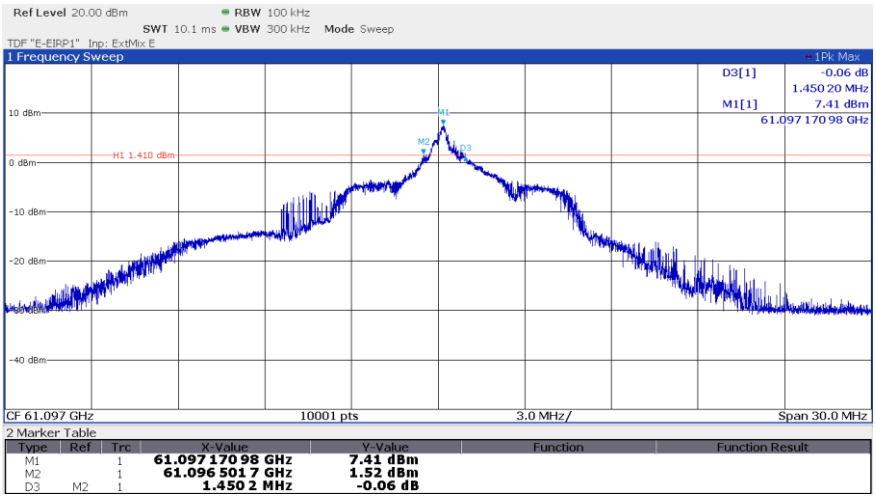
Remarks: For detailed test results please refer to following test protocols.

No limit defined for the occupied bandwidth!

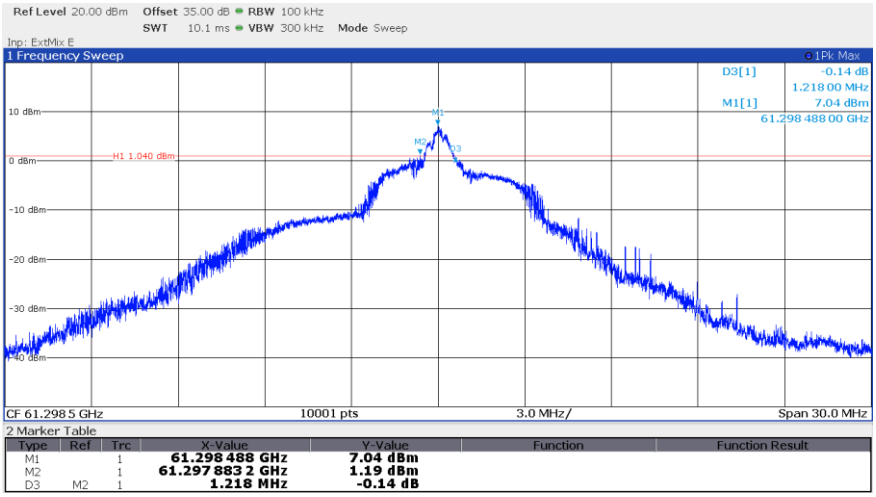
5.2.6 Test protocols

6dB EBW

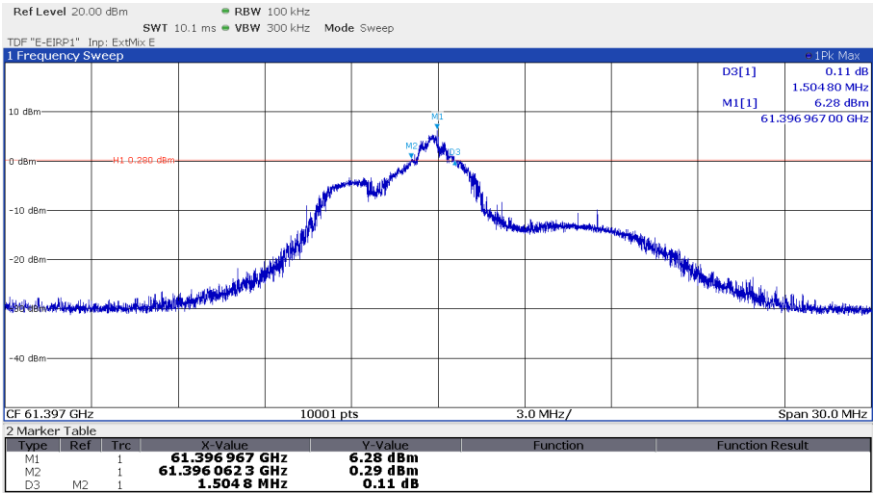
CH1



CH3

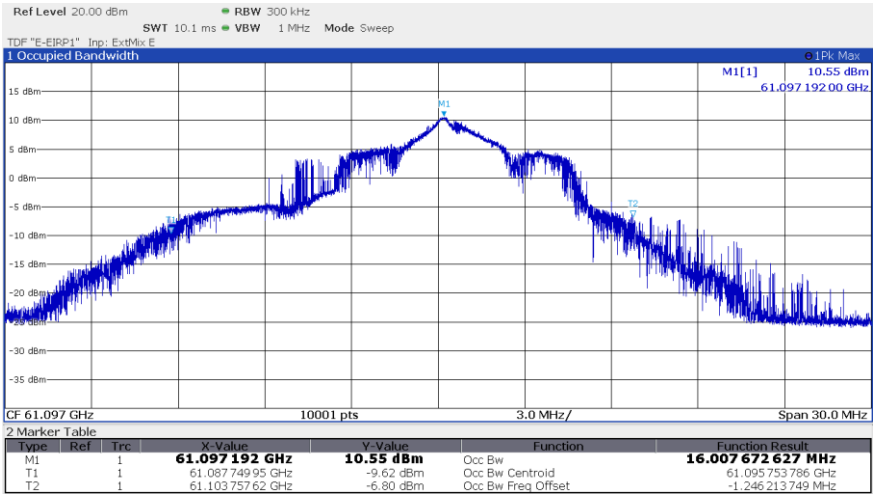


CH4



99% OBW

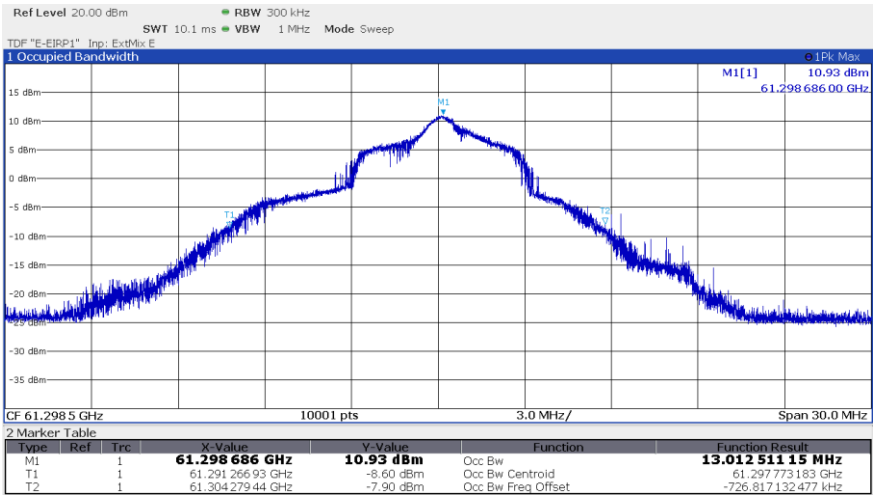
CH1



2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**61.097 192 GHz**	**10.55 dBm**	Occ Bw	**16.007 672 627 MHz**
T1		1	61.087 749 95 GHz	-9.62 dBm	Occ Bw Centroid	61.095 753 786 GHz
T2		1	61.103 757 62 GHz	-6.80 dBm	Occ Bw Freq Offset	-1.246 213 749 MHz

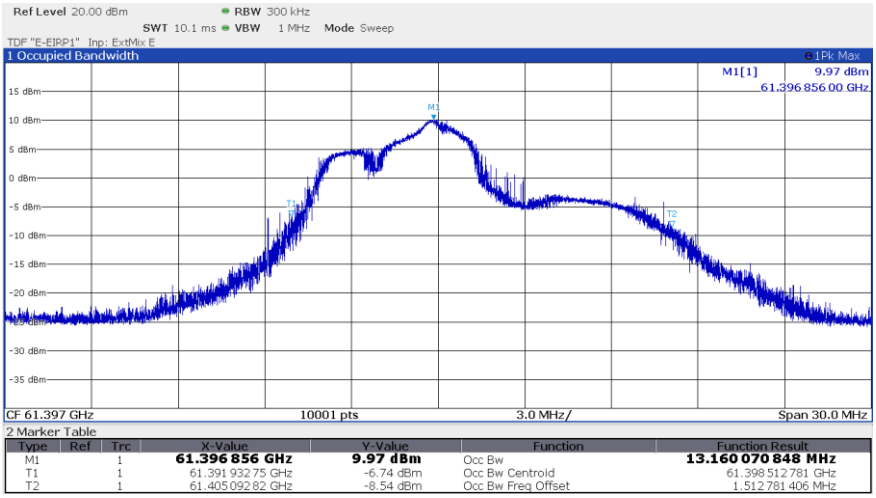
CH3



2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**61.298 686 GHz**	**10.93 dBm**	Occ Bw	**13.012 511 15 MHz**
T1		1	61.291 266 93 GHz	-8.60 dBm	Occ Bw Centroid	61.297 773 183 GHz
T2		1	61.304 279 44 GHz	-7.90 dBm	Occ Bw Freq Offset	-726.817 132 477 kHz

CH4



2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**61.396 856 GHz**	**9.97 dBm**	Occ Bw	**13.160 070 848 MHz**
T1		1	61.391 932 75 GHz	-6.74 dBm	Occ Bw Centroid	61.398 512 781 GHz
T2		1	61.405 092 82 GHz	-8.54 dBm	Occ Bw Freq Offset	1.512 781 406 MHz

5.3 EIRP

For test instruments and accessories used see section 6 Part **CPR 3**.

5.3.1 Description of the test location

Test location: Anechoic chamber 1
Test distance: 1 m

5.3.2 Photo documentation of the test set-up

See Attachment B for detailed photo documentation of the test set-up.

5.3.3 Applicable standard

According to FCC Part 15C, Section 15.255(c)(2)(v):
For field disturbance sensors/radars that occupy 500 MHz bandwidth or less that are contained wholly within the frequency band 61.0–61.5 GHz, the average power of any emission, measured during the transmit interval, shall not exceed 40 dBm, and the peak power of any emission shall not exceed 43 dBm. In addition, the average power of any emission outside of the 61.0–61.5 GHz band, measured during the transmit interval, but still within the 57–71 GHz band, shall not exceed 10 dBm, and the peak power of any emission shall not exceed 13 dBm.

According to RSS-210 J.3.2.a:
FDS devices that occupy a bandwidth of 500 MHz or less and where this bandwidth is contained wholly within the frequency band 61.0-61.5 GHz shall comply with the following limits: the equipment shall not exceed 40 dBm average e.i.r.p. and 43 dBm peak e.i.r.p. in the 61.0-61.5 GHz band. In addition, the average and peak e.i.r.p. of any emission outside of the band 61.0-61.5 GHz, but still within the band 57-71 GHz, shall not exceed 10 dBm average e.i.r.p. and 13 dBm peak e.i.r.p.

5.3.4 Description of Measurement

The radiated emission of the fundamental wave from the EUT is measured using a spectrum analyser and appropriate linear polarized antennas. The setup of the EUT and the measurement procedure is in accordance to ANSI C63.10, Item 9.8 and 9.11. The EUT is measured in TX continuous unmodulated under normal conditions.

Analyser settings:

PK measurement:	RBW: 30 MHz	VBW: 80 MHz	Detector: PK	Trace. Max hold
AV measurement:	RBW: 30 MHz	VBW: 80 MHz	Detector: RMS	Trace. Max hold

5.3.5 Test result

Channel	Frequency	Level PK	Limit PK	Margin PK	Level AV	Limit AV	Margin AV
(#)	(GHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)
CH1	61.1	12.1	43.0	-30.9	8.7	40.0	-31.3
CH3	61.3	12.0	43.0	-31.0	8.4	40.0	-31.6
CH4	61.4	12.1	43.0	-30.9	8.5	40.0	-31.5

EIRP limit according to FCC Part 15C, Section 15.255(c)(2)(v):

For field disturbance sensors/radars that occupy 500 MHz bandwidth or less that are contained wholly within the frequency band 61.0–61.5 GHz, the average power of any emission, measured during the transmit interval, shall not exceed 40 dBm, and the peak power of any emission shall not exceed 43 dBm. In addition, the average power of any emission outside of the 61.0–61.5 GHz band, measured during the transmit interval, but still within the 57–71 GHz band, shall not exceed 10 dBm, and the peak power of any emission shall not exceed 13 dBm.

Limit according to RSS-210 J.3.2.a:

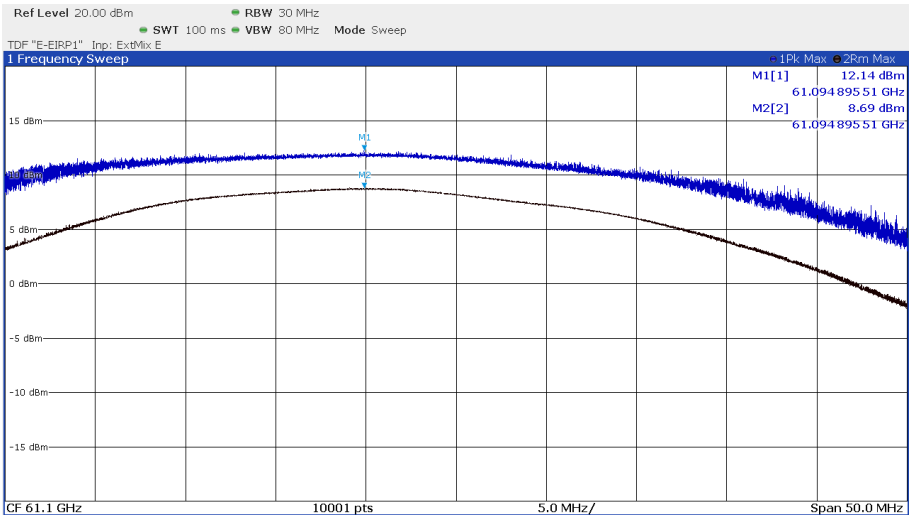
FDS devices that occupy a bandwidth of 500 MHz or less and where this bandwidth is contained wholly within the frequency band 61.0-61.5 GHz shall comply with the following limits: the equipment shall not exceed 40 dBm average e.i.r.p. and 43 dBm peak e.i.r.p. in the 61.0-61.5 GHz band. In addition, the average and peak e.i.r.p. of any emission outside of the band 61.0-61.5 GHz, but still within the band 57-71 GHz, shall not exceed 10 dBm average e.i.r.p. and 13 dBm peak e.i.r.p.

The requirements are **FULFILLED.**

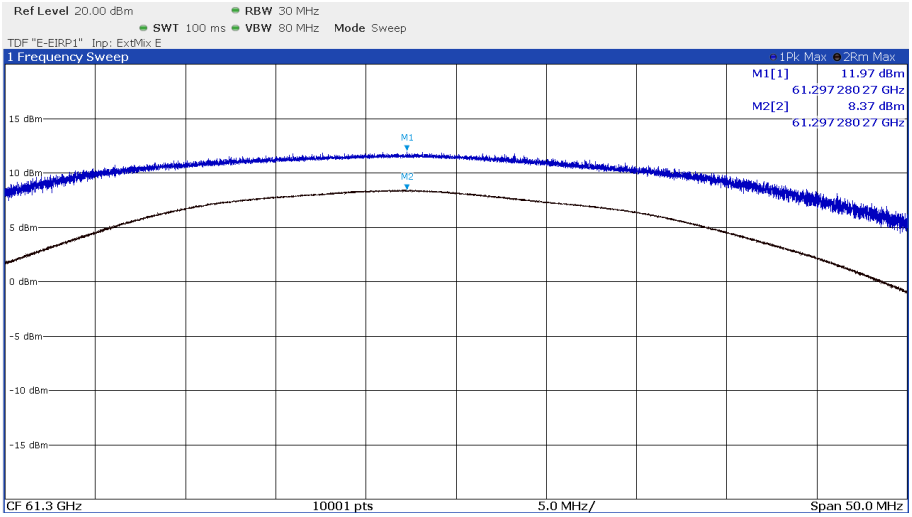
Remarks: For detailed test results please refer to following test protocols.

5.3.6 Test protocols

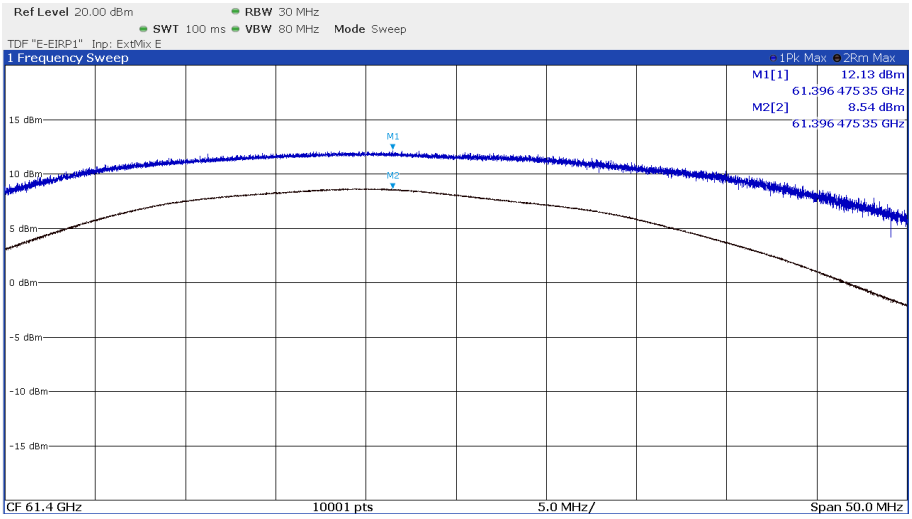
CH1



CH3



CH4



5.4 Peak conducted output power

Remarks: Not applicable, no peak conducted output power limit defined for FDS which operate in compliance with 15.255(c)(2)(v) or RSS-210 J.3.2.

5.5 Spurious emissions

For test instruments and accessories used see section 6 Part **SER1, SER 2, SER 3**.

5.5.1 Description of the test location

Test location: OATS 1
Test distance: 3 m

Test location: Anechoic chamber 1
Test distance: 3 m (1 GHz – 18 GHz)
Test distance: 1 m (18 GHz – 40 GHz)
Test distance: 1 m (40 GHz – 200 GHz)

5.5.2 Photo documentation of the test set-up

See Attachment B for detailed photo documentation of the test set-up.

5.5.3 Applicable standard

According to FCC Part 15C, Section 15.255 (d):
(1) The power density of any emissions outside the 57-71 GHz band shall consist solely of spurious emissions.
(2) Radiated emissions below 40 GHz shall not exceed the general limits in §15.209.
(3) Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm2 at a distance of 3 meters.
(4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

According to RSS-210 J.4:
Any emissions outside the band 57-71 GHz shall consist solely of spurious emissions and shall not exceed:

a. the fundamental emission levels
b. the general field strength limits specified in RSS-Gen for emissions below 40 GHz
c. 90 pW/cm2 at a distance of 3 m for emissions between 40 GHz and 200 GHz

5.5.4 Description of Measurement

The radiated emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. The setup of the EUT and the measurement procedure is in accordance to ANSI C63.10, Item 9. In the frequency range above 1 GHz a spectrum analyser is used with appropriate linear polarized antennas. If the emission level in peak mode complies with the average limit testing is stopped and peak values will be reported, otherwise, the emission is measured in average mode again and reported. The EUT is measured in TX continuous mode under normal conditions.

Instrument settings:

9 kHz – 150 kHz:	RBW: 200 Hz,	Detector: Quasi peak, Mes. Time: 1 s,
150 kHz – 30 MHz:	RBW: 9 kHz,	Detector: Quasi peak, Mes. Time: 1 s,
30 MHz – 1 GHz:	RBW: 120 MHz,	Detector: Quasi peak, Mes. Time: 1 s,
1 GHz – 40 GHz:	RBW: 1 MHz,VBW: 3 MHz,	Detector: Max. peak, Trace: Max. hold, Sweep: Auto
40 GHz – 200 GHz:	RBW: 1 MHz,VBW: 3 MHz,	Detector: RMS, Trace: Max. hold, Sweep: Auto

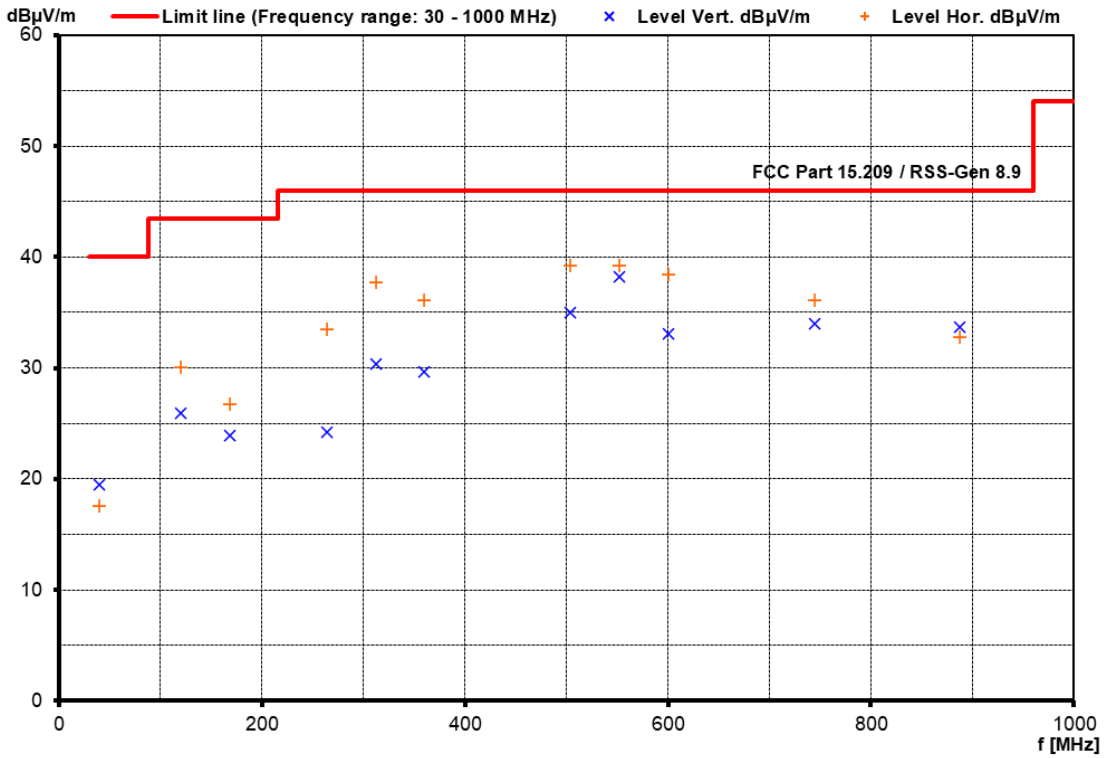
5.5.5 Test result f < 1 GHz

According to FCC 15.209					
Frequency (MHz)	Reading (dBµV)	Correction (dB)*	Field strength (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
0.010	38.9	-59.4	-20.5	47.6	-68.1
0.032	38.0	19.2	-22.8	37.5	-60.3
0.200	32.0	17.6	-30.4	21.6	-52.0
4.000	8.9	17.9	-13.2	30.0	-43.2
16.000	9.7	18.2	-12.1	30.0	-42.1
26.000	2.6	17.6	-19.8	30.0	-49.8

* Correction = Antenna factor + Δ alternative test site + distance extrapolation factor

According to RSS-Gen 8.9				
Frequency (kHz)	Field strength (dBµV/m)	QP calc. (dBµA/m)	Limit (dBµA/m)	Dlimit (dB)
10	-20.5	-72.0	16.1	-88.1
32	-22.8	-74.3	6.0	-80.3
200	-30.4	-81.9	-9.9	-72.0
4000	-13.2	-64.7	-21.9	-42.8
16000	-12.1	-63.6	-21.9	-41.7
26000	-19.8	-71.3	-21.9	-49.4

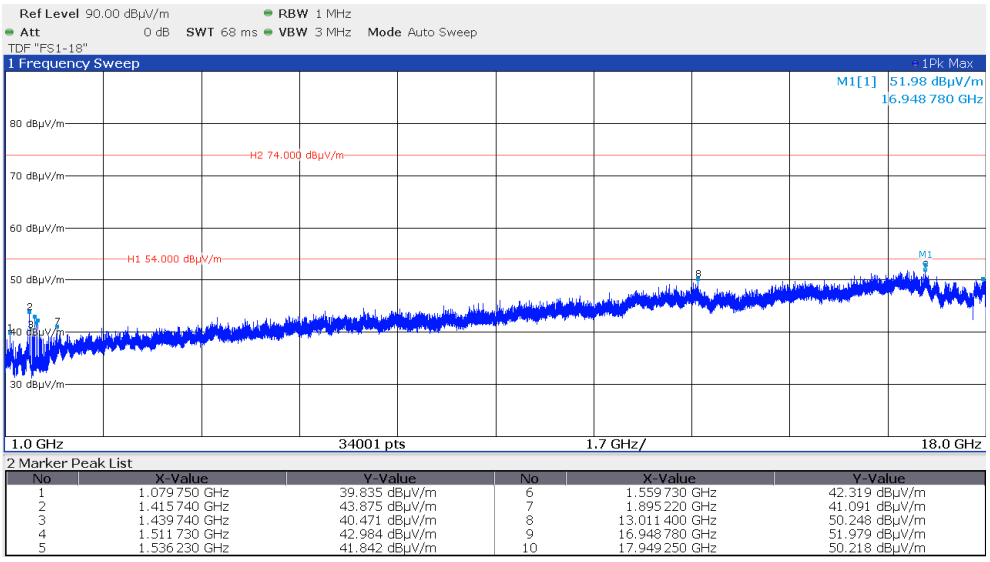
According to FCC 15.209 / RSS-Gen 8.9								
Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
39.50	2.7	-0.4	16.7	17.9	19.4	17.5	40.0	-20.6
120.00	8.6	13.3	17.3	16.8	25.9	30.1	43.5	-13.4
168.00	4.7	8.0	19.2	18.7	23.9	26.7	43.5	-16.8
264.00	5.0	14.2	19.2	19.3	24.2	33.5	46.0	-12.5
312.00	9.8	16.6	20.6	21.1	30.4	37.7	46.0	-8.3
360.00	7.6	13.6	22.1	22.5	29.7	36.1	46.0	-9.9
504.00	9.1	13.0	25.9	26.2	35.0	39.2	46.0	-6.8
552.00	11.1	11.8	27.1	27.4	38.2	39.2	46.0	-6.8
600.00	4.8	9.8	28.3	28.6	33.1	38.4	46.0	-7.6
744.00	3.4	5.1	30.6	31.0	34.0	36.1	46.0	-9.9
888.00	0.9	-0.4	32.7	33.2	33.6	32.8	46.0	-12.4



Note: For frequencies < 1 GHz the general radiated limits has been applied. During the measurements no emissions from the EUT could be detected in the frequency range 9 kHz to 30 MHz, given values only represent the noise floor.

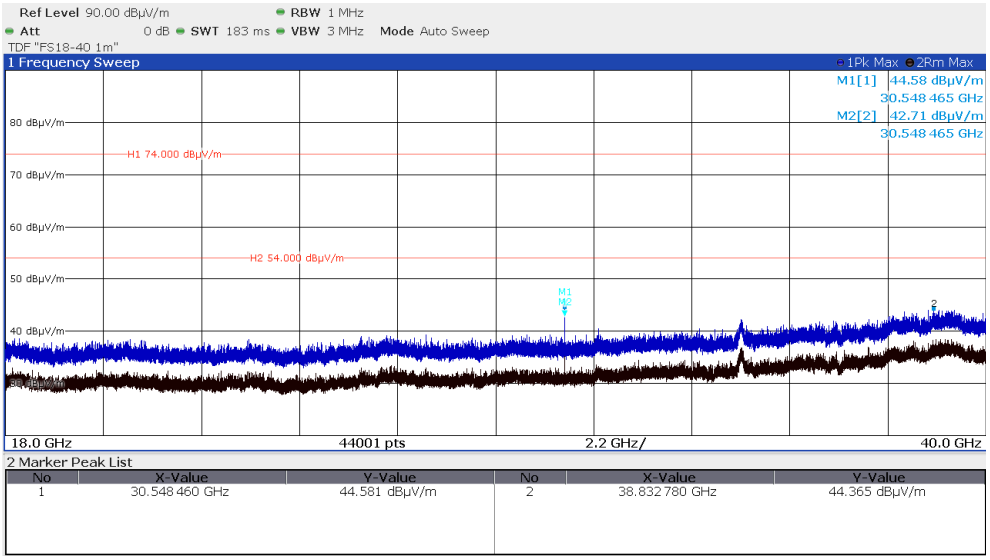
5.5.6 Test result 1 GHz < f < 40 GHz

CH1, 61.1 GHz:



2 Marker Peak List

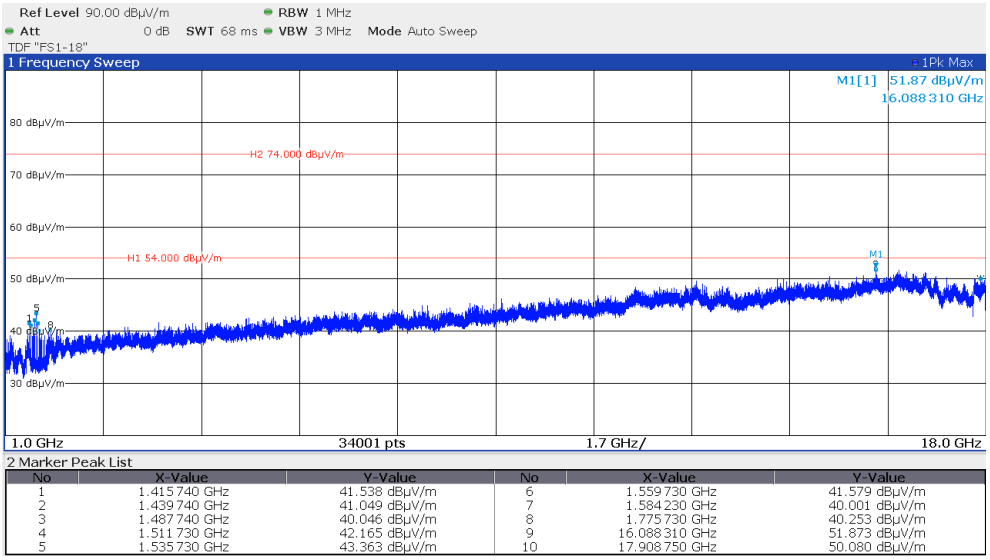
No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.079 750 GHz	39.835 dBµV/m	6	1.559 730 GHz	42.319 dBµV/m
2	1.415 740 GHz	43.875 dBµV/m	7	1.895 220 GHz	41.091 dBµV/m
3	1.439 740 GHz	40.471 dBµV/m	8	13.011 400 GHz	50.248 dBµV/m
4	1.511 730 GHz	42.984 dBµV/m	9	16.948 780 GHz	51.979 dBµV/m
5	1.536 230 GHz	41.842 dBµV/m	10	17.949 250 GHz	50.218 dBµV/m



2 Marker Peak List

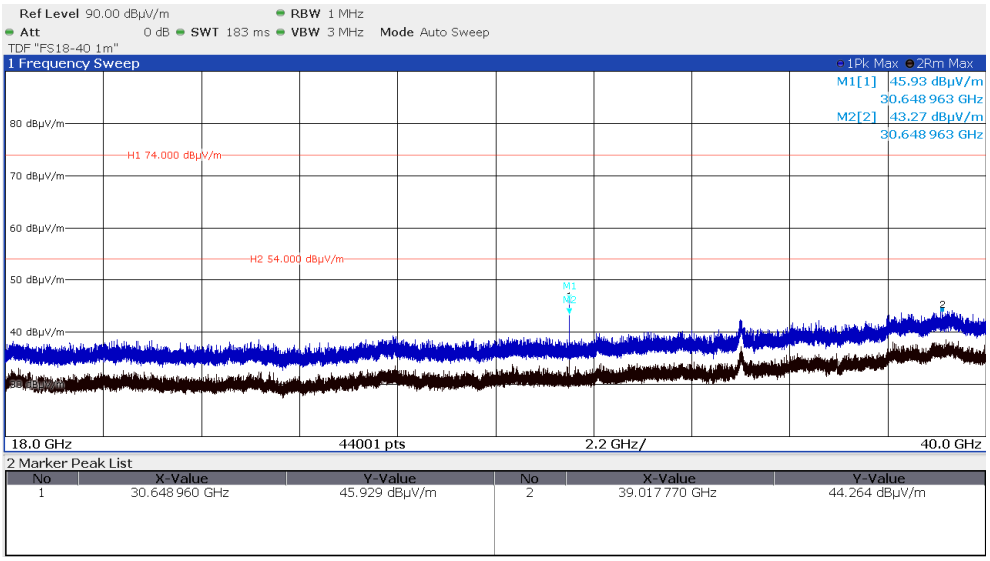
No	X-Value	Y-Value	No	X-Value	Y-Value
1	30.548 460 GHz	44.581 dBµV/m	2	38.832 780 GHz	44.365 dBµV/m

CH3, 61.3 GHz:



2 Marker Peak List

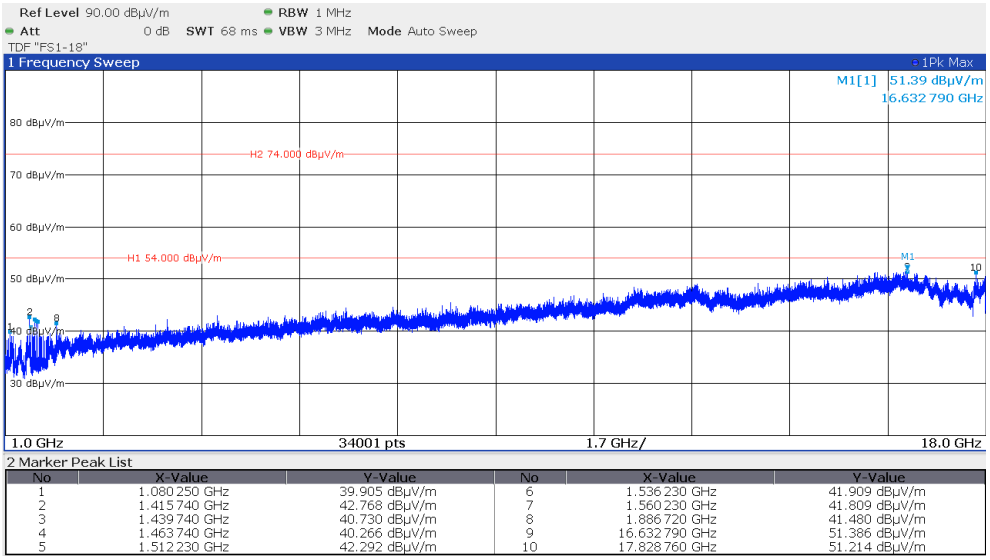
No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.415 740 GHz	41.538 dBµV/m	6	1.559 730 GHz	41.579 dBµV/m
2	1.439 740 GHz	41.049 dBµV/m	7	1.584 230 GHz	40.001 dBµV/m
3	1.487 740 GHz	40.046 dBµV/m	8	1.775 730 GHz	40.253 dBµV/m
4	1.511 730 GHz	42.165 dBµV/m	9	16.088 310 GHz	51.873 dBµV/m
5	1.535 730 GHz	43.363 dBµV/m	10	17.908 750 GHz	50.080 dBµV/m



2 Marker Peak List

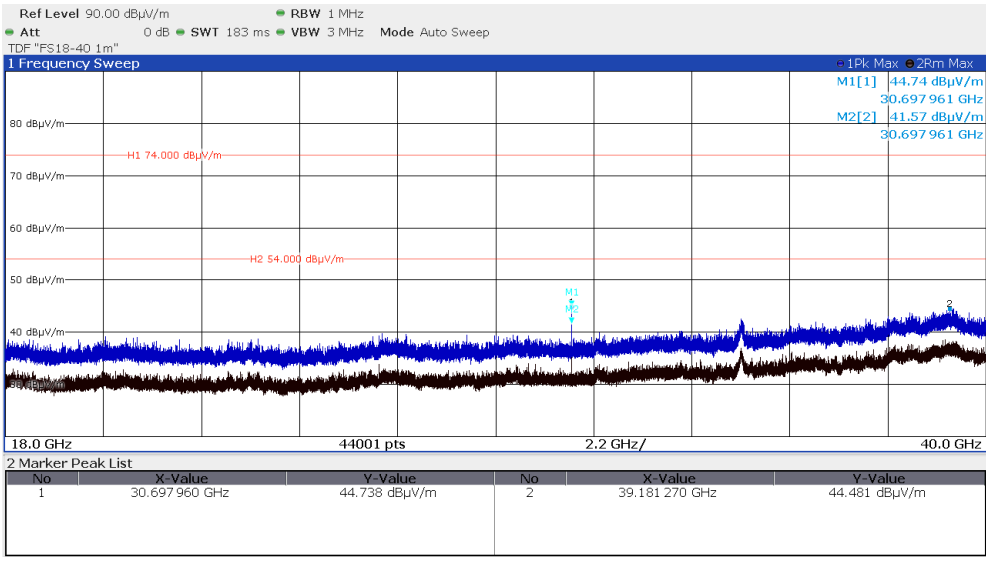
No	X-Value	Y-Value	No	X-Value	Y-Value
1	30.648 960 GHz	45.929 dBµV/m	2	39.017 770 GHz	44.264 dBµV/m

CH4, 61.4 GHz:



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.080 250 GHz	39.905 dBµV/m	6	1.536 230 GHz	41.909 dBµV/m
2	1.415 740 GHz	42.768 dBµV/m	7	1.560 230 GHz	41.809 dBµV/m
3	1.439 740 GHz	40.730 dBµV/m	8	1.886 720 GHz	41.480 dBµV/m
4	1.463 740 GHz	40.266 dBµV/m	9	16.632 790 GHz	51.386 dBµV/m
5	1.512 230 GHz	42.292 dBµV/m	10	17.828 760 GHz	51.214 dBµV/m



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	30.697 960 GHz	44.738 dBµV/m	2	39.181 270 GHz	44.481 dBµV/m

Note: For frequencies < 40 GHz the general radiated limits has been applied. For 18-40 GHz measurement distance was changed to 1 m, transducer factor is corrected accordingly for 3 m limits.

5.5.7 Test result f > 40 GHz

Determination of the EIRP emission limit for f > 40 GHz:

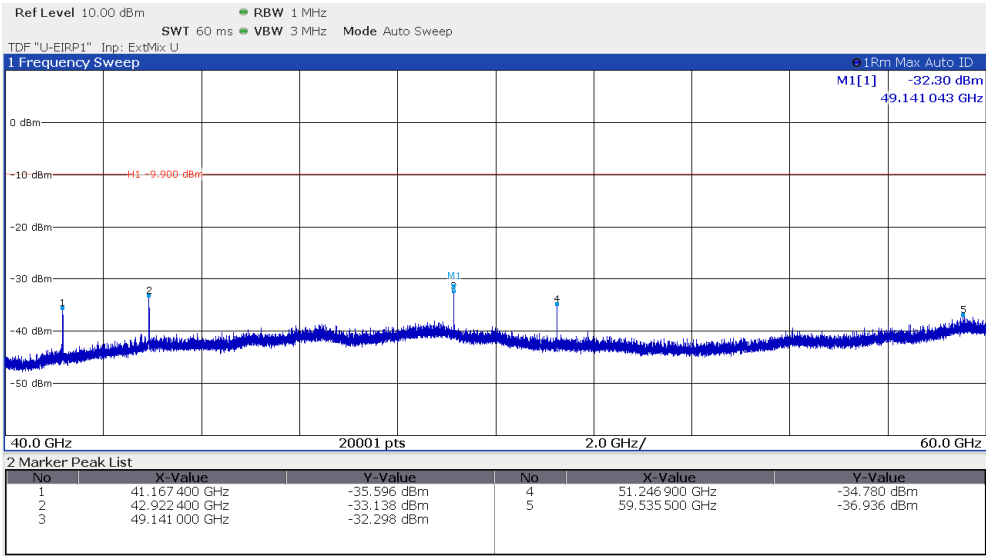
For calculation of the limit the friis formula is used.

$$P_d = \frac{P_{out} * G}{4 * \Pi * r^2}$$

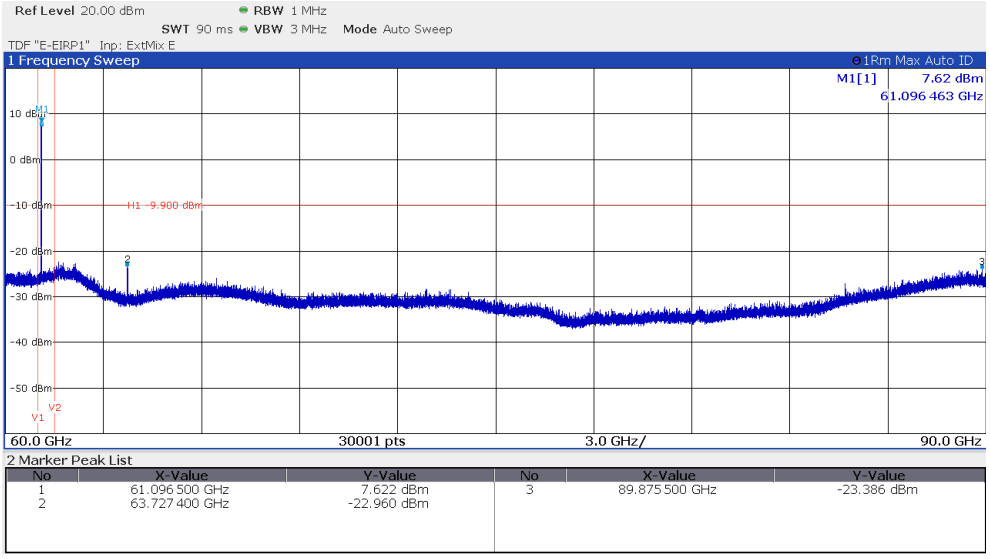
Pout * G = EIRP;
Therefore $EIRP = P_d * 4 * \pi * r^2$
$EIRP = -9.9$ dBm

where
r is the measurement distance (3 m)
P_d is the emission density (90 pW/cm^2

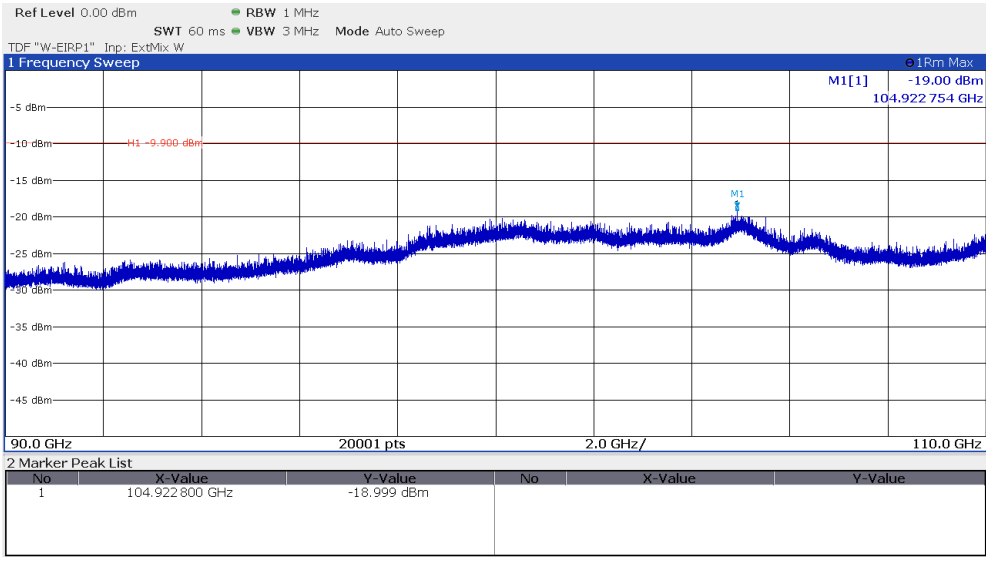
CH1, 61.1 GHz:

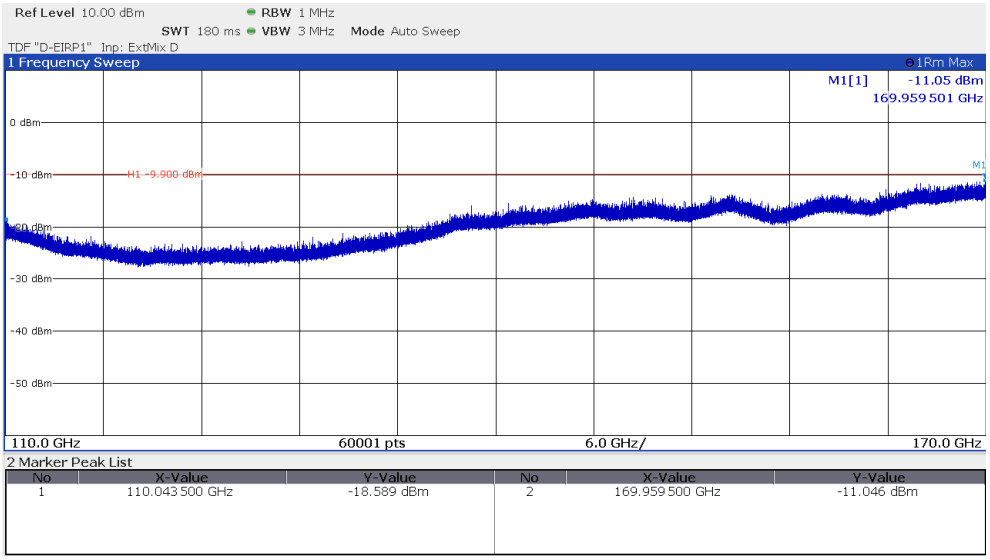


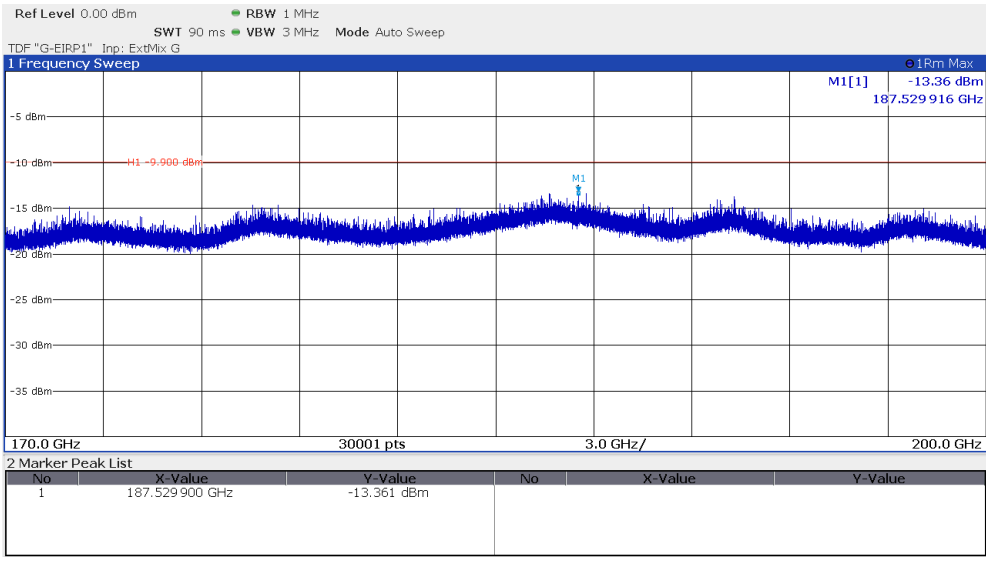
Note: To minimize unintended mixing products generated by the external mixer the AutoID function was used.



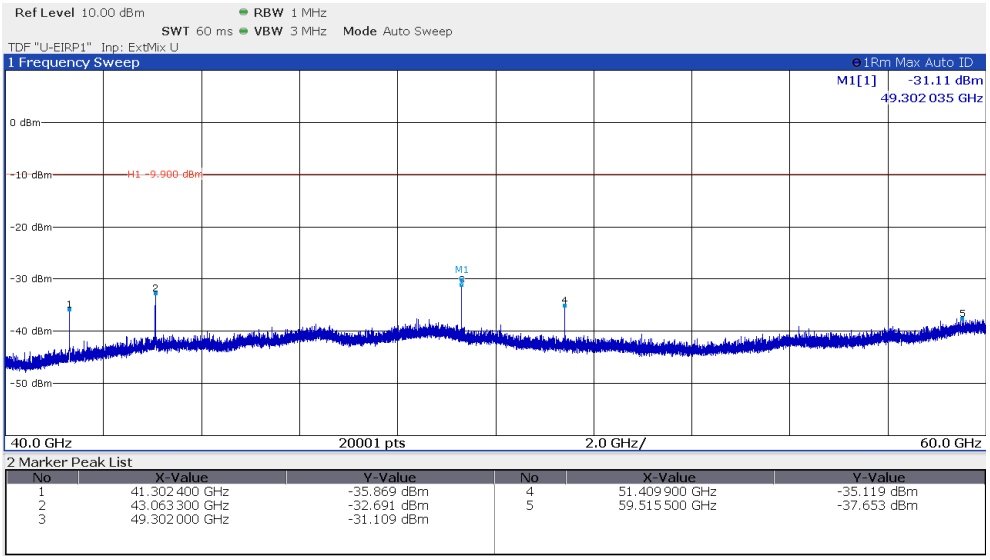
Note: To minimize unintended mixing products generated by the external mixer the AutoID function was used.



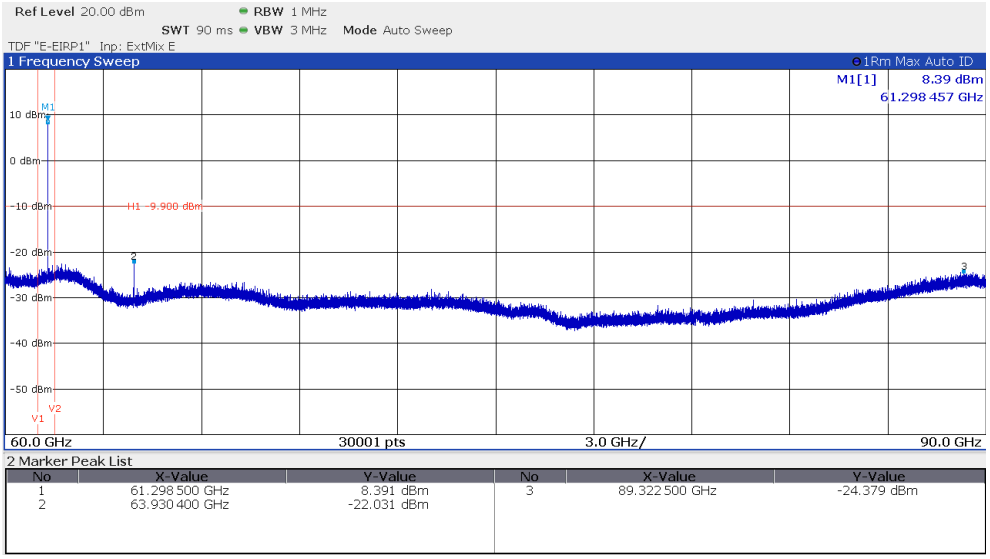




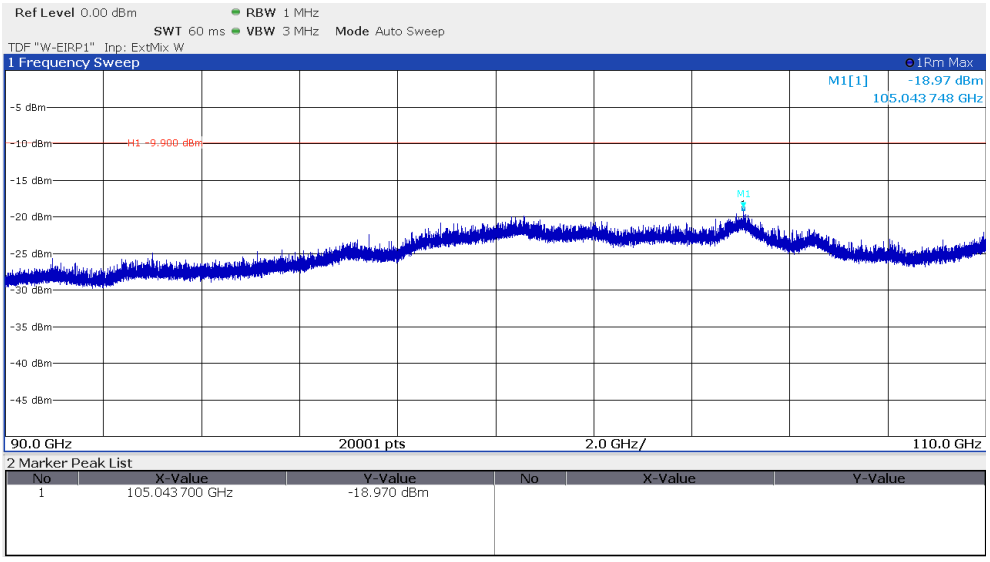
CH3, 61.3 GHz:

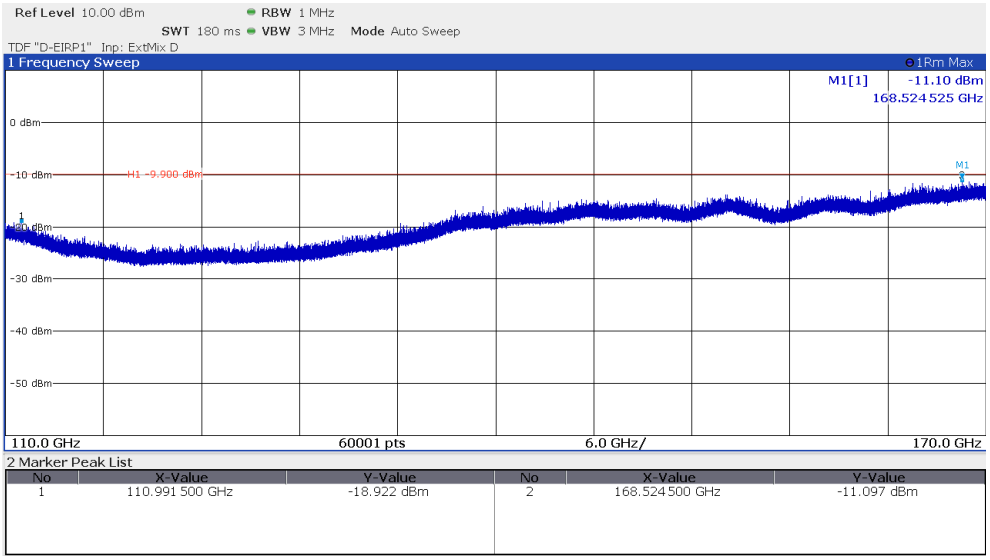


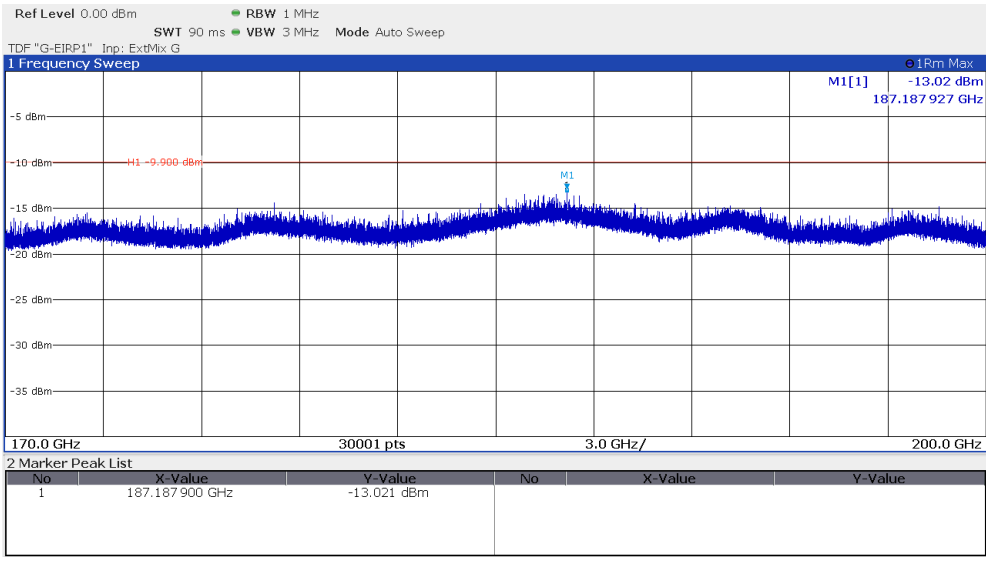
Note: To minimize unintended mixing products generated by the external mixer the AutoID function was used.



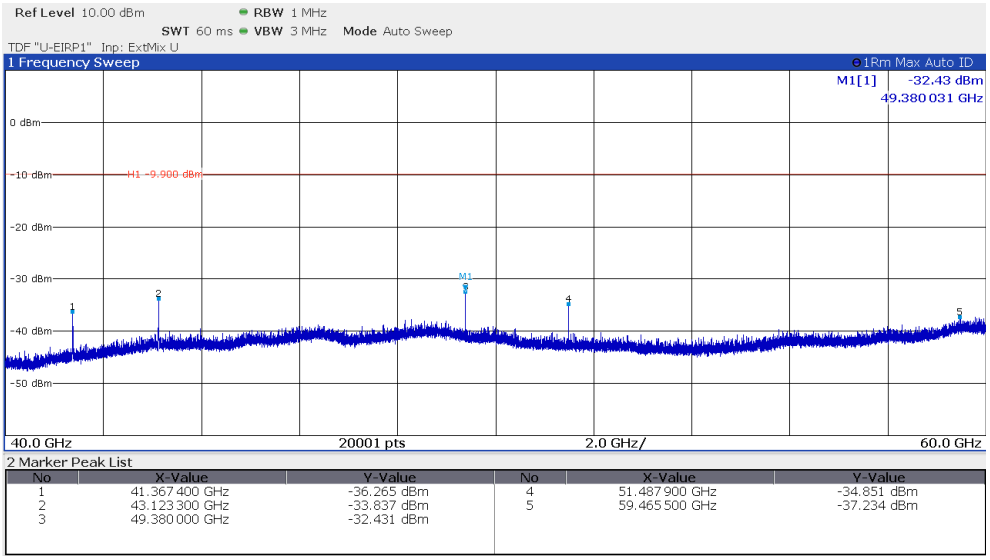
Note: To minimize unintended mixing products generated by the external mixer the AutoID function was used.



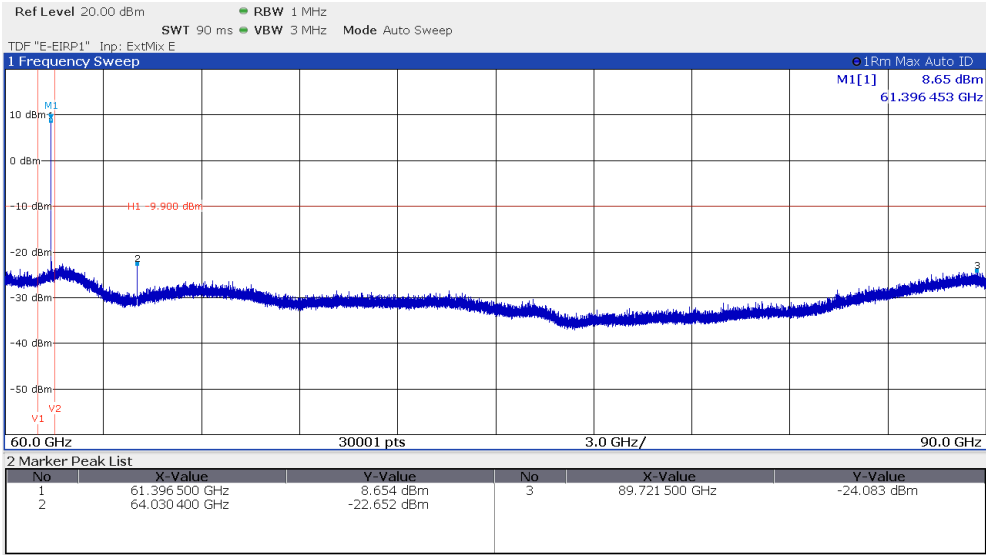




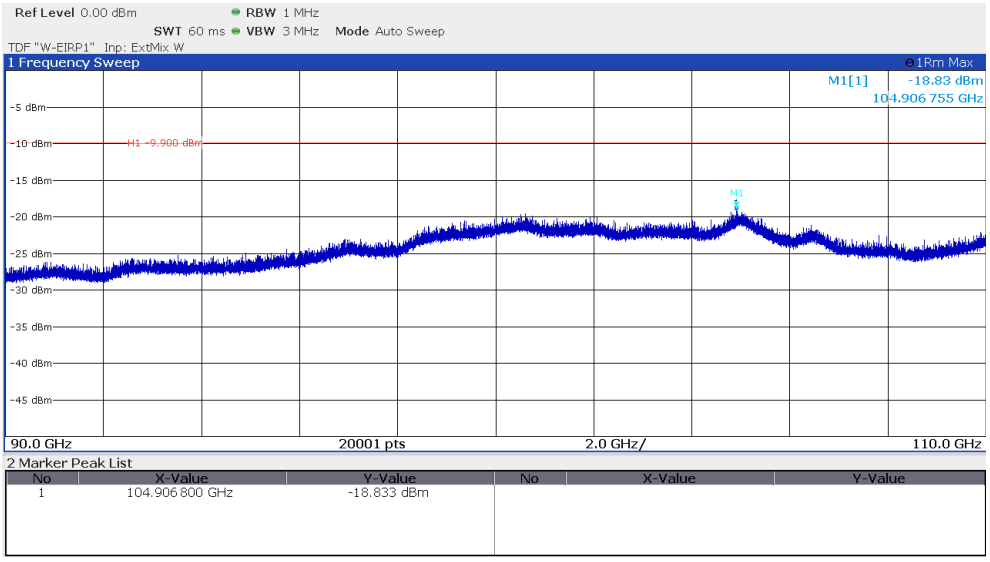
CH4, 61.4 GHz:

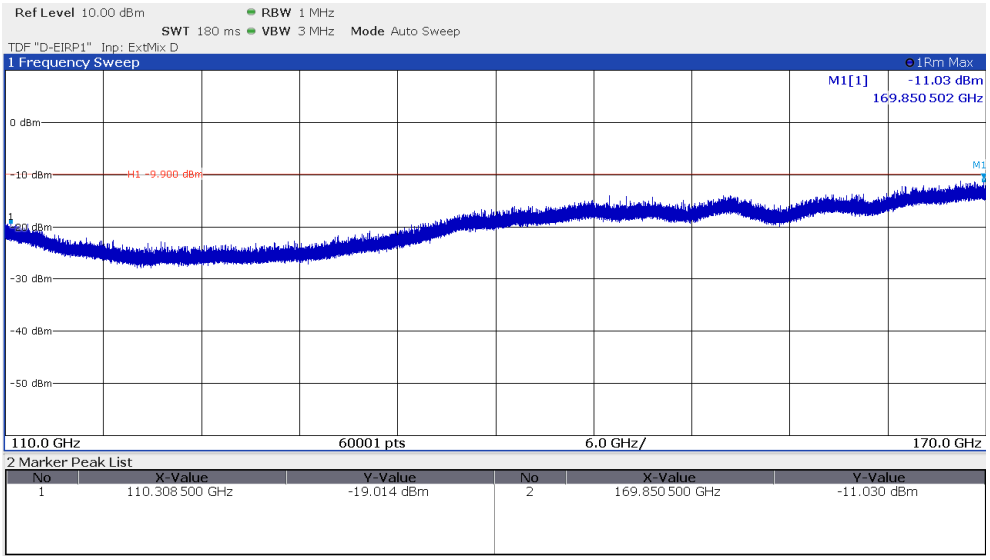


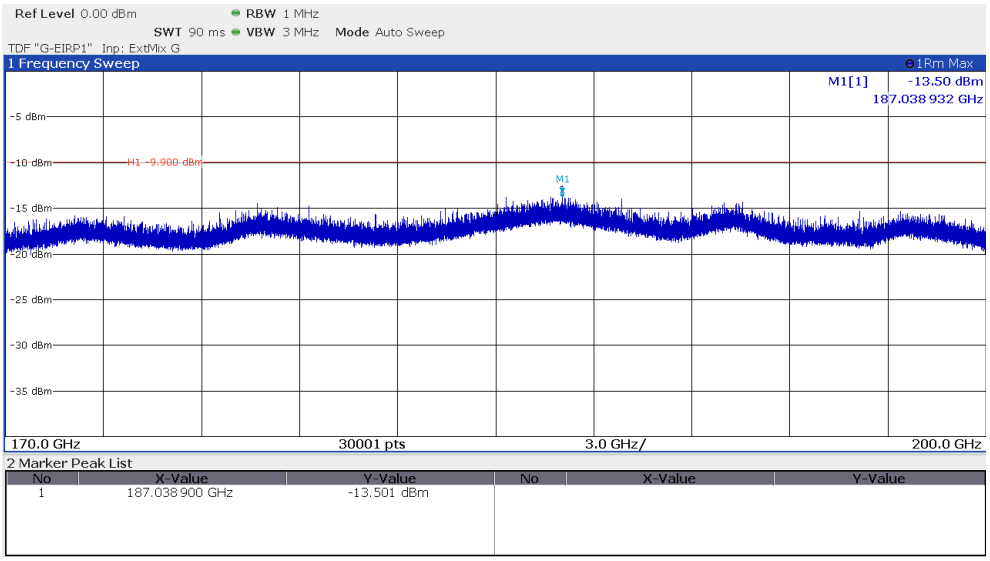
Note: To minimize unintended mixing products generated by the external mixer the AutoID function was used.



Note: To minimize unintended mixing products generated by the external mixer the AutoID function was used.







Average limit according to FCC Part 15C, Section 15.255(d):

(1) The power density of any emissions outside the 57-71 GHz band shall consist solely of spurious emissions.
(2) Radiated emissions below 40 GHz shall not exceed the general limits in §15.209.
(3) Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm^2 at a distance of 3 meters.
(4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

General radiated limit according to FCC Part 15C, Section 15.209:

Frequency (MHz)	15.209 Limits (µV/m)	Measurement distance (m)
0.009 - -0.49	2400/f(kHz)	300
0.49 – 1.705	24000/f(kHz)	30
1.705 – 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Limit according to RSS-210 J.4:

Any emissions outside the band 57-71 GHz shall consist solely of spurious emissions and shall not exceed:

d. the fundamental emission levels
e. the general field strength limits specified in RSS-Gen for emissions below 40 GHz
f. 90 pW/cm2 at a distance of 3 m for emissions between 40 GHz and 200 GHz

General radiated limit according to RSS-Gen 8.9:

Frequency (MHz)	RSS-Gen Limits (µA/m)	Measurement distance (m)
0.009 - -0.49	63.7/f(kHz)	300
0.49 – 1.705	63.7/f(kHz)	30
1.705 – 30.0	0.08	30

Frequency (MHz)	RSS-Gen Limits (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

The requirements are **FULFILLED.**

Remarks: For spurious emissions measurements CW samples #1, #2, #3 were used.

The measurement was performed up to 200 GHz.

5.6 Frequency stability

For test instruments and accessories used see section 6 Part **MB**.

5.6.1 Description of the test location

Test location: AREA4

5.6.2 Photo documentation of the test set-up

See Attachment B for detailed photo documentation of the test set-up.

5.6.3 Applicable standard

According to FCC Part 15C, Section 15.255(f):
Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

According to RSS-210 J.6:
Fundamental emissions shall be contained within the frequency bands specified in this annex during all conditions of operation when tested at the temperature and voltage variations specified for the frequency stability measurement in RSS-Gen.
Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

5.6.4 Description of Measurement

The frequency stability is measured with the spectrum analyser. The sweep points are set to maximum for higher the frequency resolution or the function “frequency counter” is used. The signal is unmodulated; the marker of the analyser is set to maximum amplitude at normal temperature, the frequency is recorded. Then the maximum supply voltage is set and the marker of the analyser is set to maximum amplitude. This procedure is done again for the minimum supply voltage. The EUT is now driven at normal supply voltage but in the climatic chamber to range the temperature from -20 °C to +50 °C in steps of 10 degrees. The drifting carrier is measured by setting the marker at the analyser.

5.6.5 Result

Test conditions		Test result	
		Frequency (GHz)	
		f_{low}	f_{high}
T_{min} (-20)°C	V_{nom}	61.09644238	61.39750778
T (-10)°C	V_{nom}	61.09654554	61.39761094
T (0)°C	V_{nom}	61.09657444	61.39763984
T (10)°C	V_{nom}	61.09654994	61.39761534
T_{nom} (20)°C	V_{min} (2.805 V)	61.09655041	61.39761581
T_{nom} (20)°C	V_{nom} (3.3 V)	61.09650170	61.39756710
T_{nom} (20)°C	V_{max} (3.795 V)	61.09654768	61.39761308
T (30)°C	V_{nom}	61.09646632	61.39753172
T (40)°C	V_{nom}	61.09647453	61.39753993
T (50)°C	V_{nom}	61.09657267	61.39763807
T (60)°C	V_{nom}	61.09678880	61.39785420
T (70)°C	V_{nom}	61.09716065	61.39822605
T (80)°C	V_{nom}	61.09773427	61.39879967
T_{max} (85)°C	V_{nom}	61.09810344	61.39916884

61.0 - 61.5 GHz range:

Lowest frequency f_l	61.0964424 GHz
Highest frequency f_h	61.3991688 GHz

Limit according to FCC Part 15C, Section 15.255(f):

Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

Limit according to RSS-Gen 6.11:

Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

The requirements are **FULFILLED.**

Remarks: The carrier is always inside of the operating frequency band of 61.0 GHz to 61.5 GHz.

5.7 Antenna requirement

According to FCC Part 15C, Section 15.203:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit that broken antennas can be replaced by the user, but the use of a standard antenna jack is prohibited. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

The EUT has an integrated antenna. No other antenna can be used with the device.

The supplied antenna meets the requirements of part 15.203.

Remarks: None

5.8 Pulsed operation (duty cycle)

For test instruments and accessories used see section 6 Part **DC**.

5.8.1 Description of the test location

Test location: Shielded Room SR2

5.8.1 Photo documentation of the test set-up – Please see attachment B

5.8.2 Applicable standard

According to FCC Part 15A, Section 15.35(c):
When the radiated emission limits are expressed in terms of average value and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete puls train, including blanking intervals, as long as the pulse train does not exceed 0.1s. In cases where the puls train exceeds 0.1s, the measured field strength shall be determined from the average absolute voltage during a 0.1s interval during which the field strength is at its maximum. The exact method of calculating the average field strength shall be submitted.

According to RSS-Gen 8.2:
When the field strength or envelope power is not constant or it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train during which the field strength or power is at its maximum value, including blanking intervals within the pulse train, provided that the pulse train does not exceed 0.1 seconds. In cases where the pulse train exceeds 0.1 seconds, the average value of field strength or output power shall be determined during a 0.1 seconds interval during which the field strength or power is at its maximum value.

5.8.3 Description of Measurement

The duty cycle factor (dB) is calculated applying the following formula:

$$K_E = 20 \log (T_{on} / T_{conn})$$

K_E: pulse operation correction factor
T_{on} on air duration
T_{conn} connection interval duration

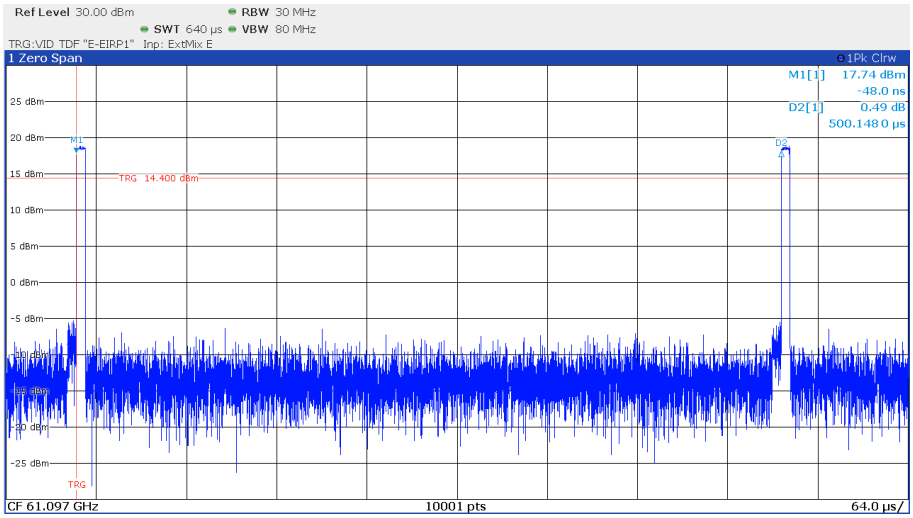
5.8.4 Test result

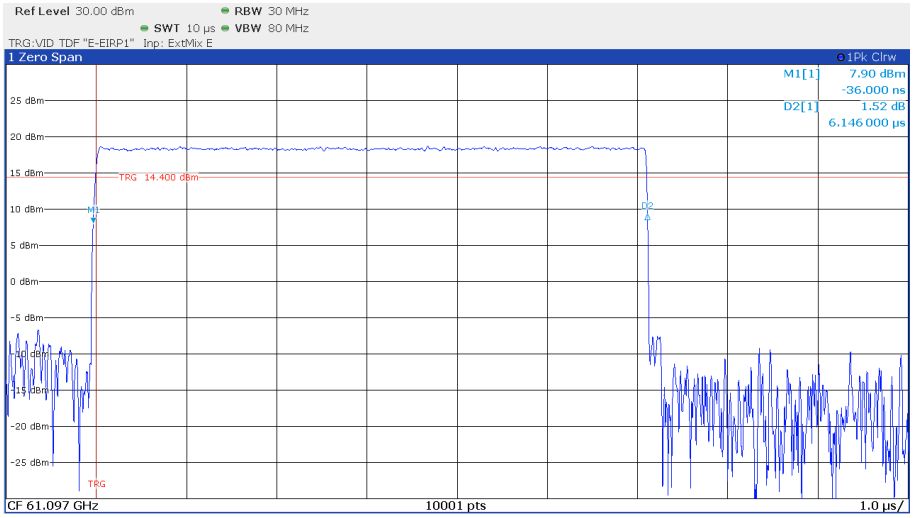
T_{on} : 6.146 µs
T_{conn} : 500.146 µs

$K_E = 20 \log (6.146 / 500.146) = -38.2$ dB

Remarks: For detailed results, please see the test protocol below.

5.8.5 Test protocol





6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	BAT-EMC 2023.0.8.0	01-02/68-13-001				
	ESCI	02-02/03-15-001	03/07/2024	03/07/2023		
	ESH 2 - Z 5	02-02/20-05-004	13/10/2025	13/10/2022	17/04/2024	17/04/2023
	ESH 3 - Z 2	02-02/50-05-185	27/10/2025	27/10/2022	19/04/2024	19/10/2023
	HM 8143	02-02/50-10-016				
	6430	02-02/50-13-014				
CPR 3	FS-Z90	02-02/11-14-003	08/05/2024	08/05/2023	08/05/2024	08/05/2023
	FSW43	02-02/11-15-001	04/05/2024	04/05/2023		
	QWH-EPRR00/WR-12/60-90	02-02/24-14-004				
	HM 8143	02-02/50-10-016				
	UFA210A (LU7-022-1000)	02-02/50-17-030				
	UFA210A (LU7-022-1000)	02-02/50-17-031				
DC	FS-Z90	02-02/11-14-003	10/05/2025	10/05/2024	10/05/2025	10/05/2024
	FSW43	02-02/11-21-001	07/06/2025	07/06/2024		
	QWH-EPRR00/WR-12/60-90	02-02/24-14-004				
	UFA210A (LU7-022-1000)	02-02/50-17-030				
	UFA210A (LU7-022-1000)	02-02/50-17-031				
FE	FS-Z90	02-02/11-14-003	08/05/2024	08/05/2023	08/05/2024	08/05/2023
	FSW43	02-02/11-15-001	04/05/2024	04/05/2023		
	QWH-EPRR00/WR-12/60-90	02-02/24-14-004				
	METRAHIT WORLD	02-02/32-15-001	22/11/2024	22/11/2023		
	WK-340/40	02-02/45-05-001	27/07/2024	27/07/2023	27/01/2024	27/07/2023
	6543A	02-02/50-05-157				
	HM 8143	02-02/50-10-016				
	UFA210A (LU7-022-1000)	02-02/50-17-030				
	UFA210A (LU7-022-1000)	02-02/50-17-031				
SER 1	ESR 7	02-02/03-17-001	01/08/2024	01/08/2023		
	HFH 2 - Z 2	02-02/24-05-020	01/06/2025	01/06/2022	05/09/2024	05/09/2023
	N-25000-N	02-02/50-05-114				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
SER 2	ESVS 30	02-02/03-05-006	27/07/2024	27/07/2023		
	VULB 9168	02-02/24-05-005	20/04/2024	20/04/2023	03/05/2024	03/05/2023
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
	50F-003 N 3 dB	02-02/50-21-010				
SER 3	FS-Z110	02-02/11-14-002	08/05/2024	08/05/2023	08/05/2024	08/05/2023
	FS-Z90	02-02/11-14-003	08/05/2024	08/05/2023	08/05/2024	08/05/2023
	FSW43	02-02/11-15-001	04/05/2024	04/05/2023		
	RPG FS-Z170	02-02/11-17-001	05/06/2024	05/06/2023		
	RPG FS-Z220	02-02/11-17-002	10/05/2024	10/05/2023		
	FS-Z60	02-02/11-18-001	08/05/2024	08/05/2023	08/05/2024	08/05/2023
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	AFS4-01000400-10-10P-4	02-02/17-13-002				

AMF-4F-04001200-15-10P	02-02/17-13-003				
LNA-40-18004000-33-5P	02-02/17-20-002				
3117	02-02/24-05-009	12/07/2024	12/07/2023		
BBHA 9170	02-02/24-05-015	02/03/2025	02/03/2022	02/08/2024	02/08/2023
QWH-UPRR00/WR-19/40-60	02-02/24-14-001				
QWH-EPRR00/WR-12/60-90	02-02/24-14-004				
QWH-WPRR00/WR-10/75-11	02-02/24-14-006				
FH-SG-170/WR6/110-170	02-02/24-17-002				
05-HA25/WR5/140-220	02-02/24-17-004				
Sucoflex N-2000-SMA	02-02/50-05-075				
HM 8143	02-02/50-10-016				
UFA210A (LU7-022-1000)	02-02/50-17-030				
UFA210A (LU7-022-1000)	02-02/50-17-031				
EA-PS 3032-05 B	02-02/50-20-008				
KMS116-GL140SE-KMS116-	02-02/50-20-026				

- End of test report -